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Why CIOs shouldn't sweat the Oracle v. SAP courtroom fight

Page 21

KM, TAKE 2

Social computing tools offer a new approach to knowledge management

Page 43

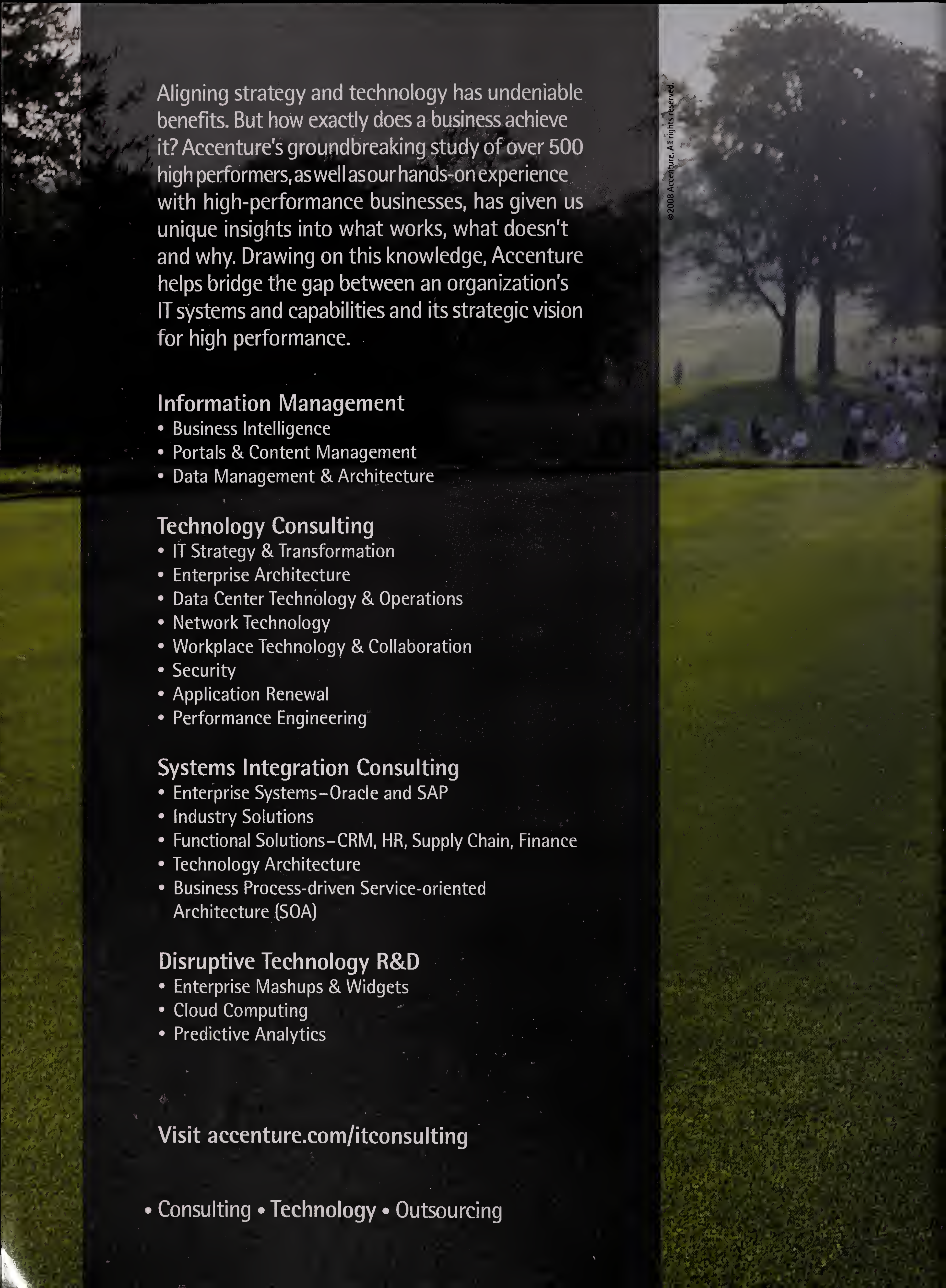
EARLY ADOPTERS

How **Vail Resorts**, **Genentech**, **Virgin America** and **Dannon** roll out new technology fast Page 30

BY STEPHANIE OVERBY

For Vail Resorts CIO **Robert Urwiler**, the best emerging tech helps the company differentiate itself from competitors.

JULY 1, 2008 | $9.00 | CIO.COM



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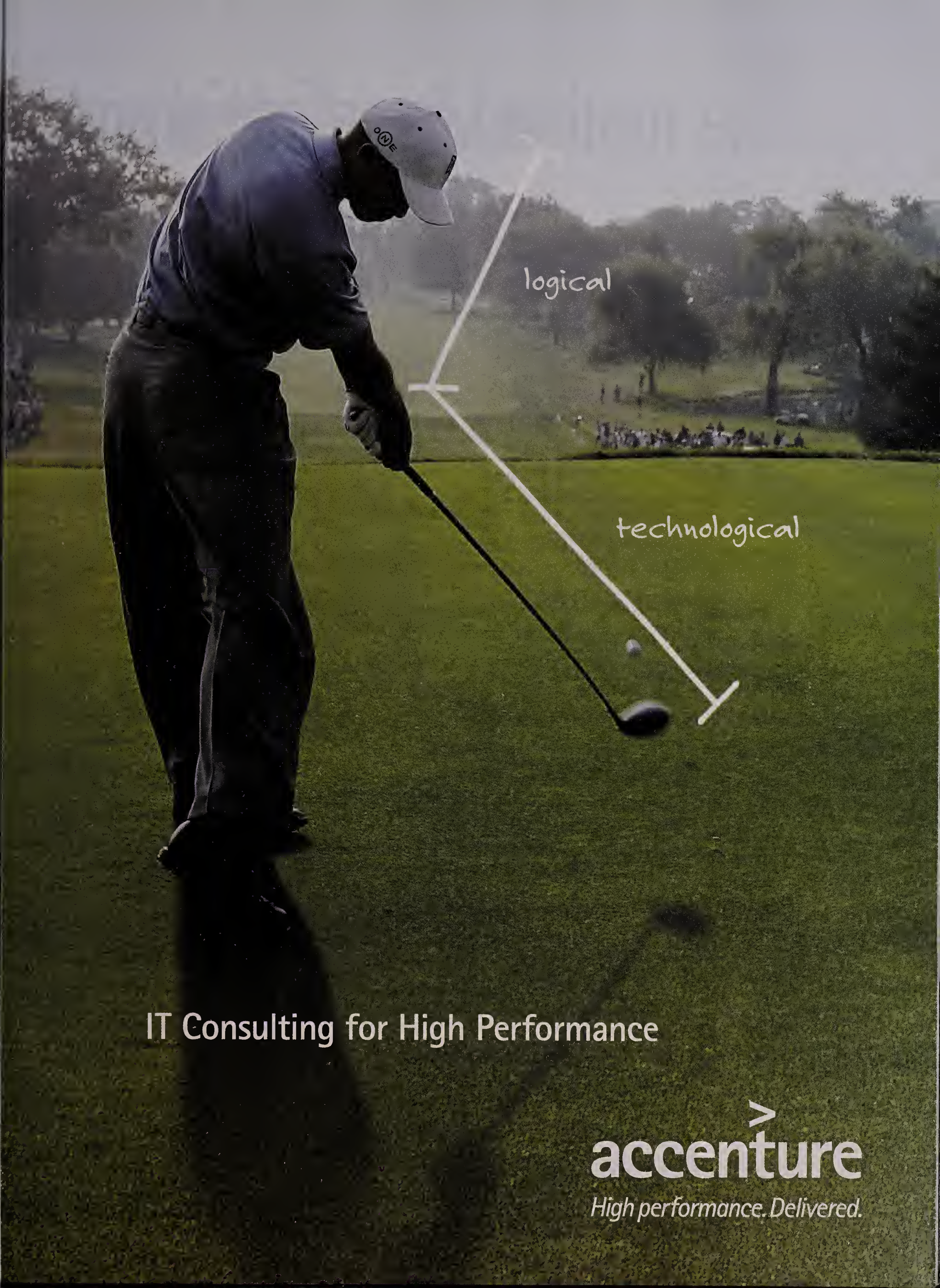
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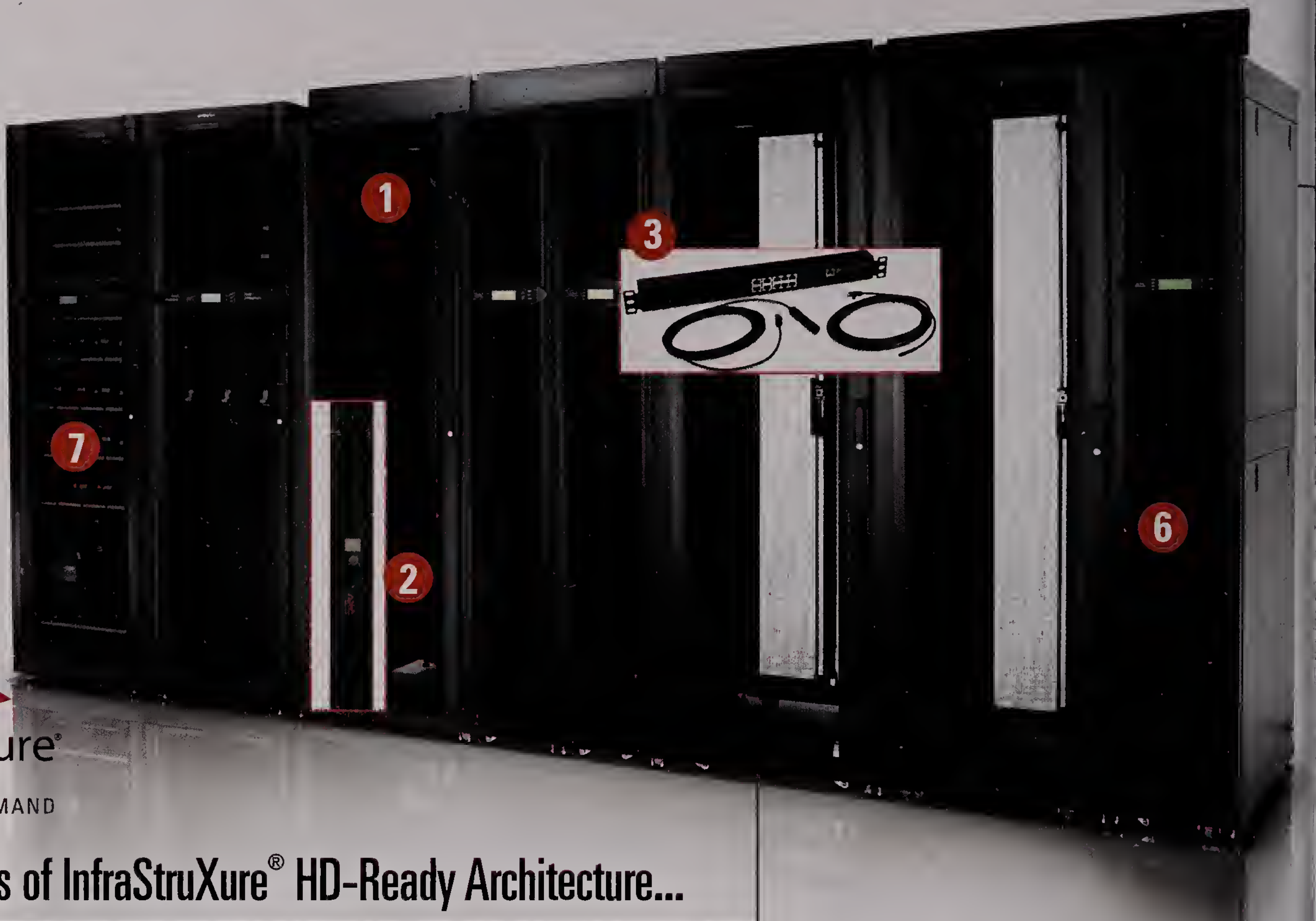

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7 Principles of InfraStruXure® HD-Ready Architecture...

1 Rack enclosures that are HD-Ready

Start with vendor neutral NetShelter® SX racks, engineered to handle the airflow and power needs of power-hungry, high-density servers.

2 Metered PDUs at the rack level

Install metered rack PDUs to indicate which racks and outlets have capacity for new HD servers... and which ones don't.

3 Temperature monitoring in the racks

Add local or remote monitoring of temperature and humidity where it counts–in your enclosures.

4 Centralized Monitoring Software

Monitor all power, cooling, security, and environments from one management system using real-time data at the row, rack, and U-level.

5 Operations software with predictive capacity management

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7 UPS power that is flexible and scalable

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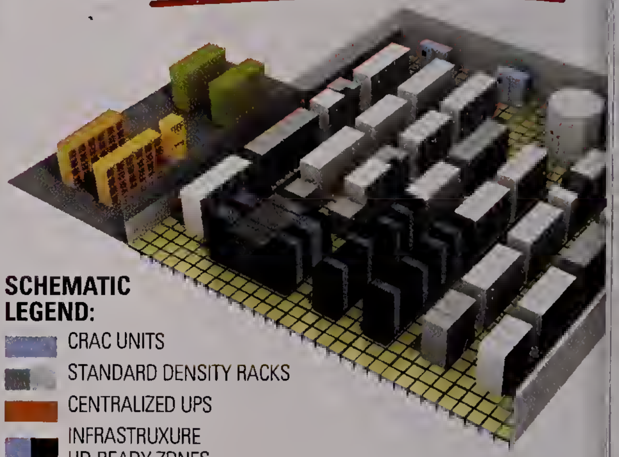
APC's ***Capacity Manager*** *has received a 2007 Data Center Products of the Year Gold Award from Searchdatacenter.com*

You can deploy High Density

...overlay an InfraStruXure zone into an existing large data center...



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⬜ STANDARD DENSITY RACKS
🟧 CENTRALIZED UPS
🟦⬛ INFRASTRUXURE HD-READY ZONES

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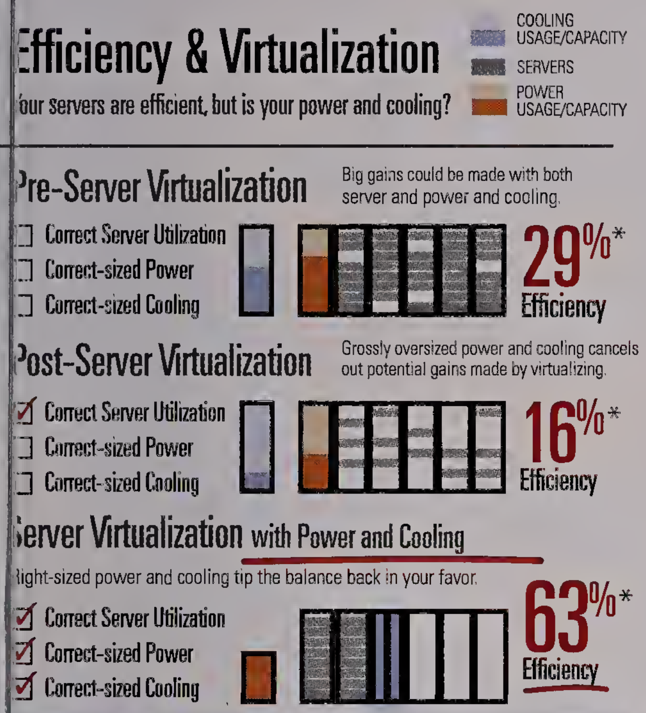
has a high speed lane



Efficiency & Virtualization

Your servers are efficient, but is your power and cooling?

Pre-Server Virtualization

Big gains could be made with both server and power and cooling.

☐ Correct Server Utilization
☐ Correct-sized Power
☐ Correct-sized Cooling

Post-Server Virtualization

Grossly oversized power and cooling cancels out potential gains made by virtualizing.

☑ Correct Server Utilization
☐ Correct-sized Power
☐ Correct-sized Cooling

Server Virtualization with Power and Cooling

Right-sized power and cooling tip the balance back in your favor.

☑ Correct Server Utilization
☑ Correct-sized Power
☑ Correct-sized Cooling

Cooling with InRow® leads to highest efficiency...

Gain thermal efficiency with our InRow cooling products. Closely coupling the AC with the heat source reduces the distance cold air must travel (from 50 feet down to 5 feet), prevents hot exhaust air from mixing with cool air in the room, and allows more targeted precision cooling.

the green grid™

*__Efficiency Index__: According to the Green Grid, efficiency is based on the relative relationship between server utilization and the overall power and cooling efficiency. If you right-size one without the other, you won't realize true efficiency gains.

(HD) racks right now...

...or deploy InfraStruXure as the foundation of your entire data center or server room.

As technology shifts toward high density, forward-thinking IT managers are laying basic HD framework in place, so they can respond quickly to future change. InfraStruXure is a simple yet dynamic drop-in solution that can be quickly scaled up to higher density. When you're ready, go from low to high density by adding enhanced monitoring, power and temperature control, software management, and higher capacity AC units.

If you're already feeling the heat from high density driven by virtualization, the InfraStruXure HD-Ready System's row based cooling and management will allow you to handle 20kw or more per rack and deliver system-wide visibility and control. The standardized architecture lets you grow modularly over time, or virtualize anywhere and anytime you need to.

Virtualization is here to stay.

And it's no wonder, since it saves space, reduces power consumption and gives the flexibility and control to maximize your IT resources. But these benefits of a smaller footprint come at a cost. Virtualized servers, even at 50% capacity, require special attention to cooling, no matter the size of the zone, system, or overall data center.

1. **Heat** Server consolidation creates higher densities per rack. This, in turn, generates more and more heat, putting your equipment and overall system at risk for downtime and failure.

2. **Inefficiency** Perimeter-only cooling solutions just can't handle the heat at its source in the racks or rows where higher densities exist. As a result, you're forced to compensate by over cooling at high energy costs--with disappointing results.

3. **Power Events** Virtual loads are constantly on the move, making it hard to predict available power and cooling. One tripped breaker could mean serious and irreversible damage to your network.

Removes barriers to high density, for good.

Power and cooling issues driven by high density shouldn't stop you from adopting valuable trends like virtualization. This is why APC has created the HD-Ready InfraStruXure architecture. As a stand-alone system or as a zone within your existing data center, InfraStruXure gets you to the next level.

Simple to design, configure, and install, HD-Ready InfraStruXure architecture lets you decide when and where to handle higher densities, in a specific zone or system-wide. Now, with HD-Ready InfraStruXure, you can get cooling into the virtualized high-density row, control power at the rack level, and manage the system through advanced software and simulation, which alerts you to potential threats to a virtualized environment.

Take the right-sized approach to true efficiency.

You're virtualizing to reduce overall energy consumption. By eliminating under-utilized servers (sometimes at a 7:1 ratio) you will waste less energy. But wait.... data center efficiency depends on the relative efficiencies of power, cooling, and servers. You can't right-size one and not the others. If you do, you've just left your efficiency savings on the table (See "Efficiency and Virtualization" to the left).

To right-size, you can depend on the efficient and modular HD-Ready InfraStruXure. Its UPS technology, combined with our one of a kind row based cooling technology with optional hot aisle containment, will neutralize heat at the source. Your equipment will be safer and more efficient running closer to 100% capacity. No more threats to equipment, no more under-utilized, oversized power and cooling.

Don't agonize, virtualize.

What are you waiting for? The APC HD-Ready InfraStruXure architecture is so versatile, anyone can virtualize, anytime, anywhere. Just drop it in and go.

APC®
by Schneider Electric

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The largest computer company in the world, IBM manufactures and sells hardware and software and offers infrastructure services, hosting services, and consulting services in areas ranging from mainframe computers to nanotechnology.

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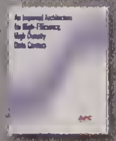
VMware is the global leader in virtualization solutions from the desktop to the data center.

Go to www.xcompatible.com to learn more about how these products work with InfraStruXure's High Density solutions.



Download a FREE copy of APC white paper #126: "An Improved Architecture for High-Efficiency, High Density Data Centers" and start running more efficiently today!

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contents

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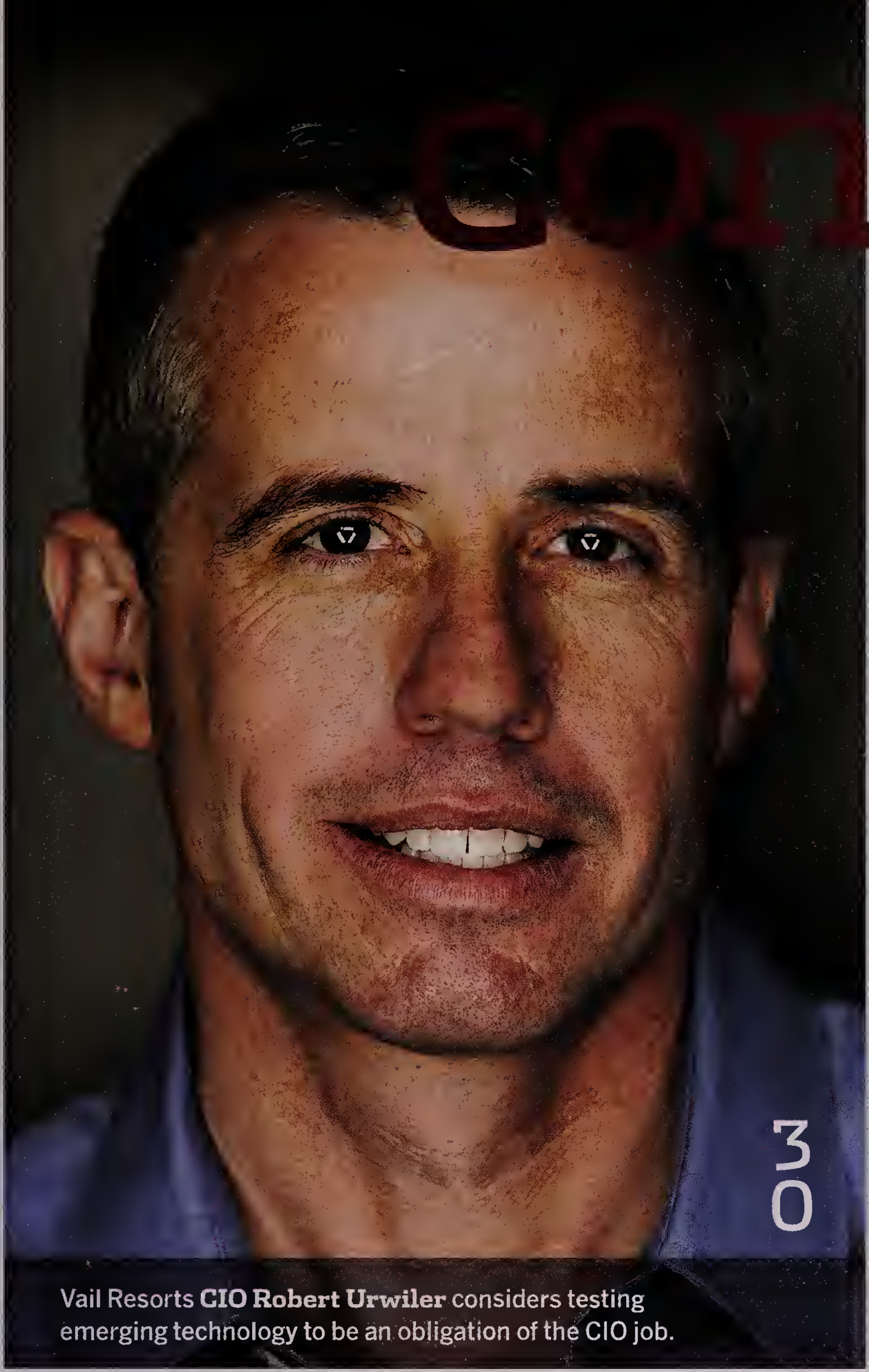

Vail Resorts **CIO Robert Urwiler** considers testing emerging technology to be an obligation of the CIO job.

30 | The Secrets of Early Adopters

COVER STORY | INNOVATION Four CIOs share their techniques for moving fast with new technology. **By Stephanie Overby**

43 | Who You Know... and What You Know

KNOWLEDGE MANAGEMENT Social networking tools promise to help companies harness the knowledge inside the heads of their employees and put it to work for the business.
By Michael Fitzgerald

48 | A Smart Course for Data

DATA MANAGEMENT PGA Tour IT chief Steve Evans defined a data collection system that serves multiple business functions and keeps customers happy. **By Thomas Wailgum**

Columns

26 | Hire for Alignment

APPLIED INSIGHT If there's still a gap between the business and information technology, you need people on your staff to understand business better.
By George E. Strouse

54 | Think Like Your Customer

STRATEGIC CIO Universal Orlando's CIO challenges market assumptions to drive business in a shrinking economy.
By Michelle McKenna

more »

A volunteer uses the PGA Tour's ShotLink system to capture data on golfers' shots for tournament operations and promotional activities.

COVER PHOTO BY DON CUDNEY

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contents (Cont.)

In Every Issue

10 | **From the Editor**
The Digital Natives are here; how will we manage them? **By Abbie Lundberg**

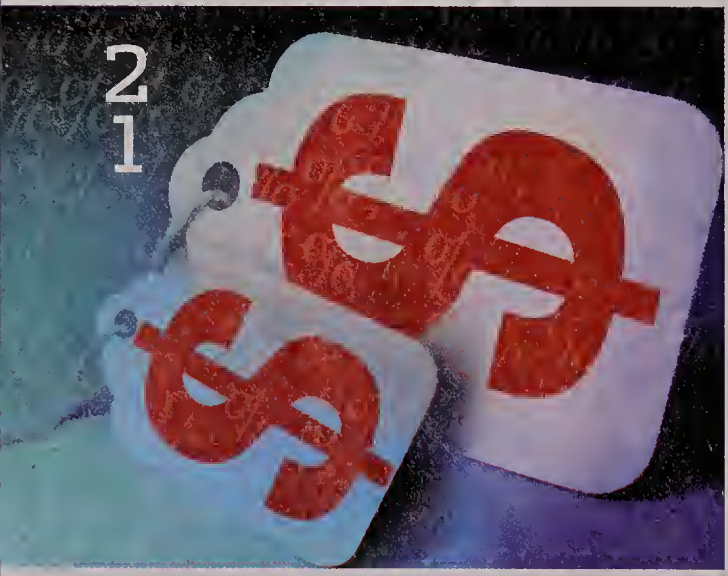
12 | **From the Publisher Emeritus**
Stop letting in guest workers and focus on education. **By Gary Beach**

15 | **Trendlines**
- SAP's mid-market push creates skills gap
- CIOs, tech vendors spread political donations
- Mash-ups: no tech experience required
- China ranks third for U.S. tech exports
- Virtual worlds project failure rate is high
- CIOs reap realignment benefits

21 | **Essential Technology**
The courtroom brawl between Oracle and SAP regarding TomorrowNow continues. But the alternatives to traditional software maintenance fees aren't going away. **By Thomas Wailgum**

58 | **Index**

60 | **Data Points**



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How Wachovia and the CIA Use Wikis and Other Web 2.0 Tools

Wachovia and the CIA have found wikis, blogs and social networks to be key problem-solving tools in the workplace—both energizing workers of every generation as well as acting as a central repository for collaboration. But is this technology sustainable? Read Chris Potts's report from the Technology Ventures conference at Cambridge University.

» **www.cio.com/article/391913** and **www.cio.com/article/389613**

» **advice.cio.com/blogs/cio_knowledge_space**

[GADGETS]

iPHONE 2.0: WHAT CIOS WANTED TO SEE

We asked five IT leaders what business-minded features they most want to see in the new Apple iPhone and why. Did they get what they wanted? CIO.com staffer Al Sacco blogged his post-release reaction.

www.cio.com/article/380663; advice.cio.com/blogs/mobile_workhorse

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Digital Natives in Our Midst

The future is here; how will we manage them?

If there's anyone under 30 working in your company, you've got Digital Natives.

Marc Prensky coined this term in 2001, in a paper titled "Digital Natives, Digital Immigrants." His starting point: "Today's students are no longer the people our educational system was designed to teach." Things need to change, and they need to change fast. Since 2001, many of those students have graduated, and they're working for you.

Digital Natives grew up immersed in technology, according to Prensky, while Digital Immigrants adopted the new technology later in life. Why does this matter? "As Digital Immigrants learn to adapt to their environment," Prensky writes, "they always retain, to some degree, their 'accent,' that is, their foot in the past.... Our Digital Immigrant instructors...are struggling to teach a population that speaks an entirely new language."

It's worse than that. Many teachers either have yet to immigrate or have no intention of doing so. Business is no better off. Today's organizations and management systems are not designed for either the new way of work that information and communications technologies have enabled or the new employees these technologies have helped to create.

This was a core topic at the recent Seattle Innovation Symposium, an intense, invitation-only summit of educators and business technology leaders led by Harvard's Rob Austin and the University of Washington's Richard Nolan. A panel moderated by Michael Eisenberg of UW's I-School explored the fundamental question of just how different these workers really are, as well as the benefits and challenges those differences represent.

One of the more intriguing issues raised was the fact that Digital Natives view as "coworkers" anyone within their network who can help them solve a problem. While this may be a wonderful way to bring new ideas into the firm, it also exposes proprietary information as workers seek to more fully define the problem space they're working in. "We've never before seen subgroups working across organizational boundaries to advance the interests of the subgroup at the expense of the corporation," said Wharton Business School professor Eric Clemons.

It was great to see so much quality thought on this topic from some of our universities' leading thinkers. For more on this topic, go to *www.cio.com/article/386113* or visit my blog at *http://advice.cio.com/blogs/difference_engine*.

Abbie Lundberg

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No More H-1B's

Stop letting in guest workers and focus on education

There's lots of disagreement about H-1B visas, the U.S. government–sponsored program that every year permits 65,000 guest workers with a bachelor's degree or the equivalent to work in America at speciality occupations ranging from computer science to fashion modeling.

Tech execs like Microsoft's Bill Gates trek to Washington to plead for increasing the annual cap to 130,000 visas because, they claim, they cannot hire enough qualified tech workers among those living in the United States.

On the other hand, labor unions, college professors and unemployed tech workers say, "Bill, that ain't so." These opponents argue that companies like Microsoft are lobbying to raise the visa cap to hire lower-priced foreign workers.

Who is right? Who is wrong? They both are. On both fronts.

The tech labor and skills shortage in America is real. So are the tens of thousands of unemployed American tech workers. The solution to this dilemma is education. The culprit responsible for our insufficient technology workforce is America's education system, particularly our inadequate science and math curricula.

Go online and read a copy of "A Nation at Risk," a document issued 25 years ago, during Ronald Reagan's first term (Find it at *www.ed.gov/pubs/NatAtRisk/index.html*.) It offers simple recommendations for fixing America's education system in order to compete in an increasingly global economy. Though many people may have read the report, few in Washington have offered substantive solutions.

A long-term—though painful—solution to our H-1B visa problem would be to eliminate H-1B visas and invest in math and science education. As the H-1B program stands, it only encourages us to ignore the problems with education.

Congress should immediately cut the cap in half and sunset the program by 2014. Abolishing the program will be painful because the companies that use the visa now will have to invest in training while this country begins a long road to education reform. Such reform could take decades. But doing away with H-1B visas is one small step in America's long journey to fix education in our nation.

I, for one, will be able to live without those foreign fashion models walking down the streets of America. (For an expanded version of this column, go to *www.cio.com/article/389263*.)

Gary J. Beach

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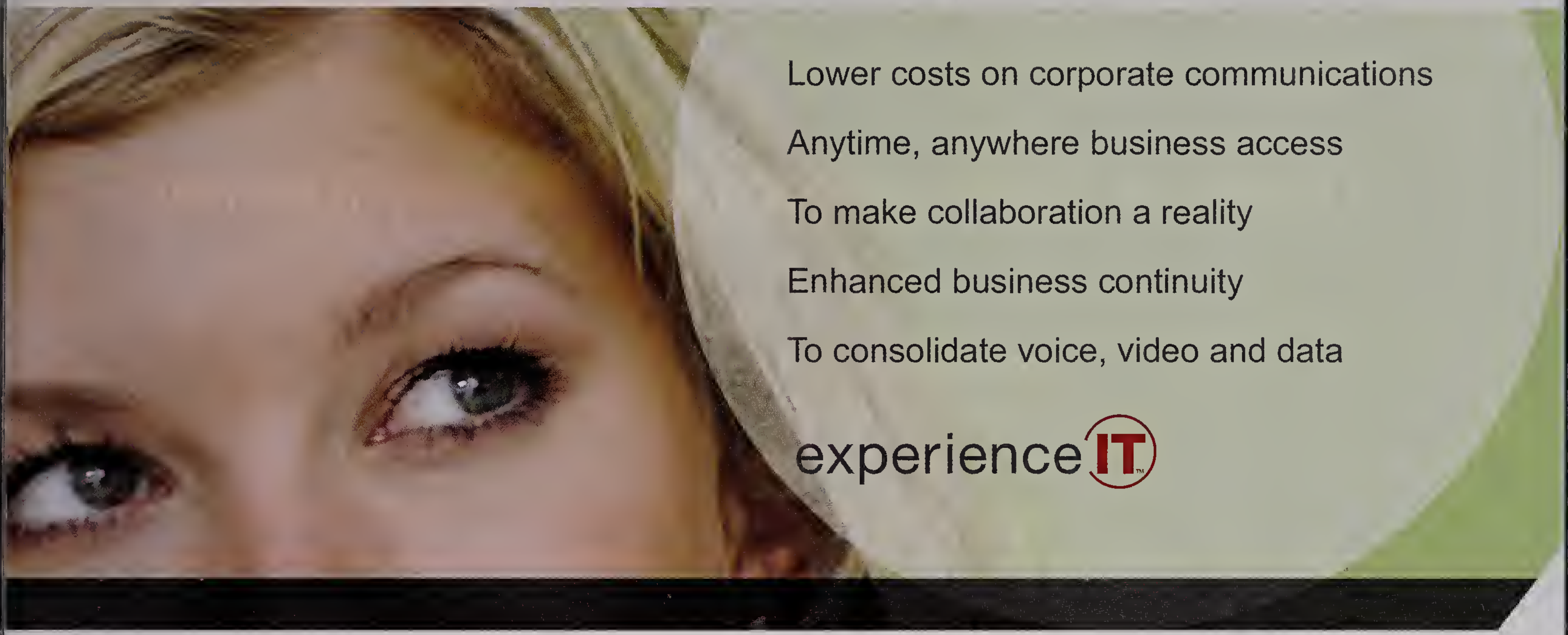

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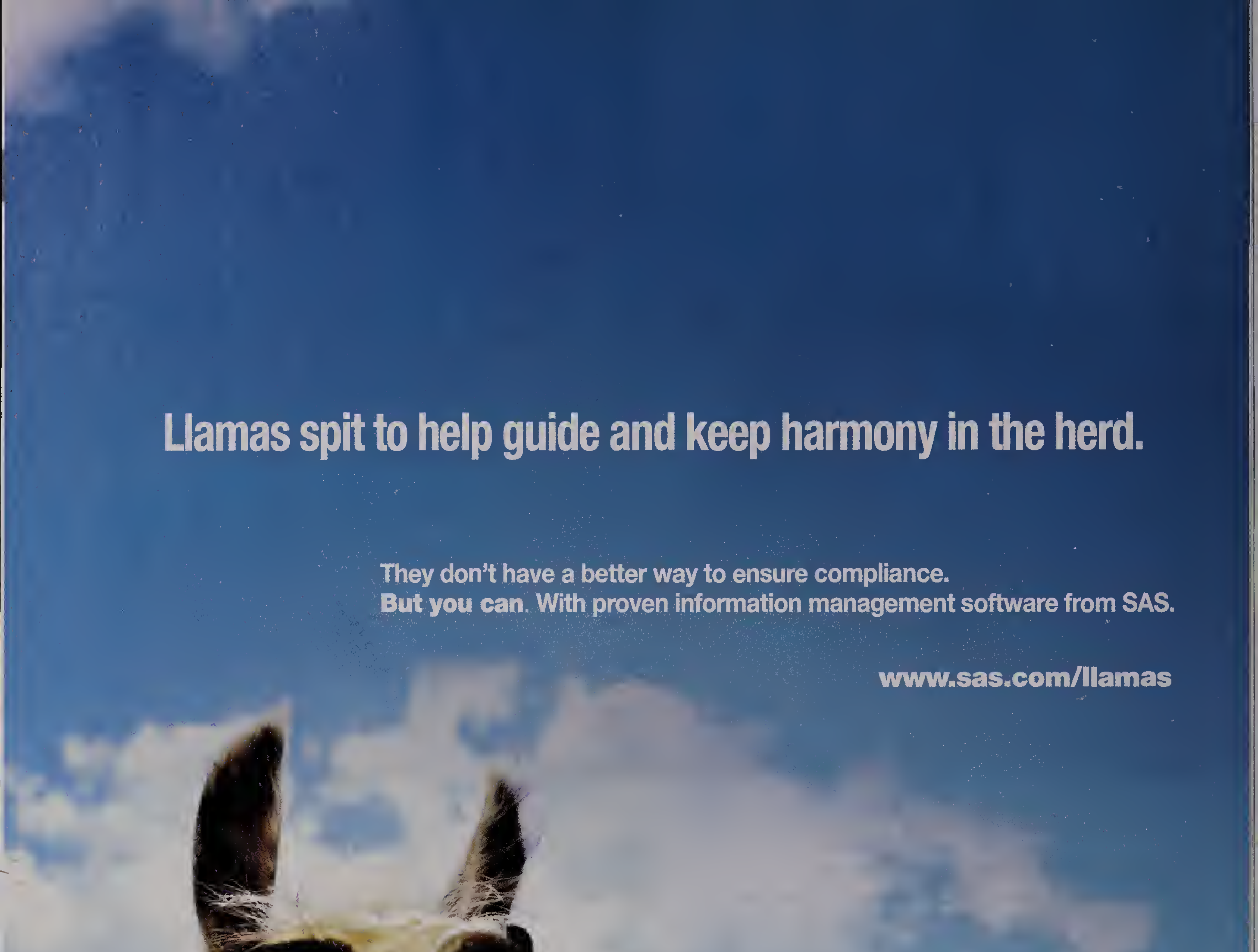

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trendlines

EDITED BY STEFF GELSTON | NEW * HOT * UNEXPECTED

SAP's Mid-Market Push Creates **Skills Gap**

STAFFING SAP's strategy to win small and midsize companies as customers while it expands its new product offerings is creating a widening supply-and-demand gap for these new SAP skills inside IT departments, according to recent IT skills and salary research from Foote Partners.

SAP's expansion has "caused skills and labor shortages that have gripped sizable segments of the employment market in North America and around the world, and created some nasty supply-and-demand fluctuations," notes David Foote, CEO and chief research officer of Foote Partners, in the firm's first-quarter 2008 "IT Skills and Certifications Pay Index."

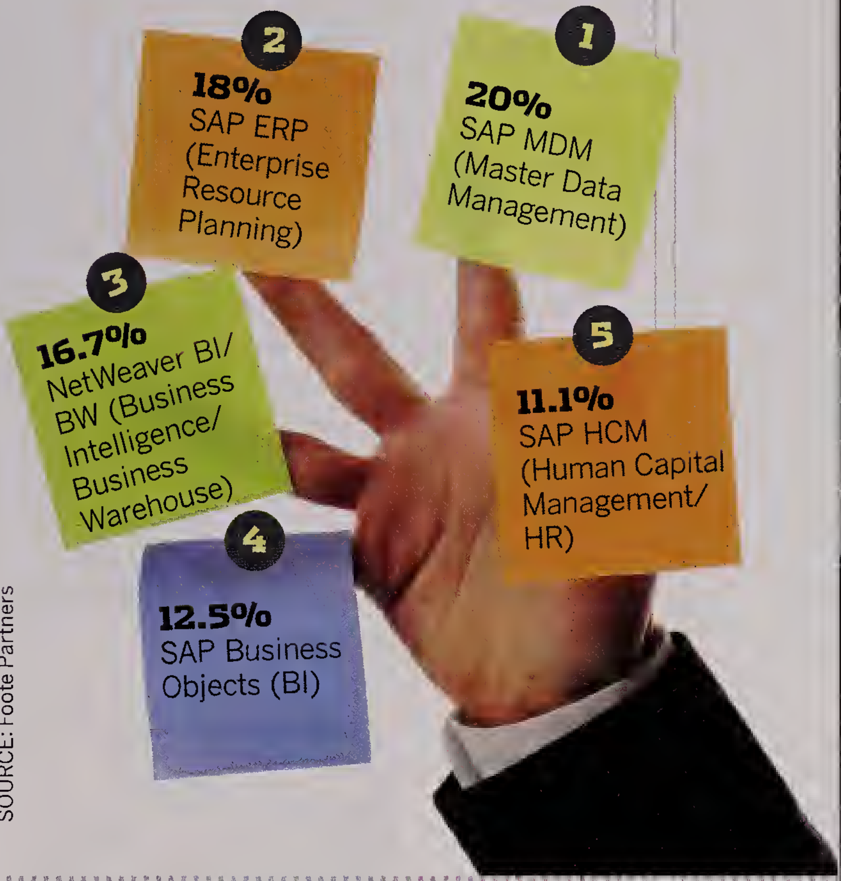
SAP product skills are among those noncertified skills displaying the most dramatic growth in market value during the past year, according to Foote Partners data.

Foote Partners estimates that SAP's products are found inside 48,000 companies in 120 countries. Newer CRM and business intelligence tools now complement the company's omnipresent ERP software. Its NetWeaver application-

Continued on Page 16

Five Most Highly Valued SAP Skills

In the past six months these SAP skills have had the greatest increase in market demand.



SOURCE: Foote Partners

CIOs, Tech Vendors Spread Political Donations

POLITICS In the race for president, CIOs have no clear favorite candidate, based on publicly available records of campaign contributions. But top executives at technology vendors favor Barack Obama. In an informal, not statistically valid survey of The Center for Responsive Politics online database of campaign contributors, *CIO* examined the 2007 and 2008 financial contributions of 50 high-profile CIOs and 50 senior executives at technology companies.

Just 15 CIOs gave directly to the presidential candidates. Of those who donated to the three major candidates, three went for presumptive Democratic nominee Barack Obama and one for Republican John McCain. None contributed to Democrat Hillary Clinton. Dave Kepler at Dow Chemical gave $4,600 to McCain. Gregor Bailar, former Capital One CIO, and Joe Smialowski, former EVP of Operations and Technology of Freddie Mac, each gave $2,300 to Obama. Northern Trust's Jana Schreuder gave $4,600 and $2,300 to Obama.

Among vendor executives, Obama edged out Clinton, 17 contributions to 14. However, four contributors supported both Democrats. McCain received six contributions.

Vendor executives were more on target in their support than CIOs. The three strong candidates got more support from vendor bigwigs than rivals such as Republican Mitt Romney and Democrat Christopher Dodd.

Oracle executives, however, are no oracles. Chairman Jeff Henley supported Republican Ron Paul, giving him $1,000. Charles Phillips, Oracle's president, gave $2,100 to Democrat John Edwards. *–Kim S. Nash*

PHOTO BY STEVE SNYDER

MASH-UPS: No Tech Experience Required

INTERNET Enterprise mash-ups are not yet a panacea for connecting all the dots of corporate data, but they will soon let companies mix and match information to help workers do their jobs better, according to a recent Forrester Research report.

"Mash-ups are trying to solve a long-standing business problem, which is combining disparate data sources," says Forrester analyst G. Oliver Young, who wrote the report. "We think mash-ups are doing it in a unique way that's more user-oriented."

Forrester defined an enterprise mash-up as "custom applications that combine multiple disparate data sources into something new and unique."

Young distinguished between enterprise and consumer mash-ups. Consumer mash-ups typically are built by a person or company and are there for anyone on the Web to use. In the enterprise, users will pull information from different systems and combine them. They will run them on a convenient portal and might represent the mash-up as a widget.

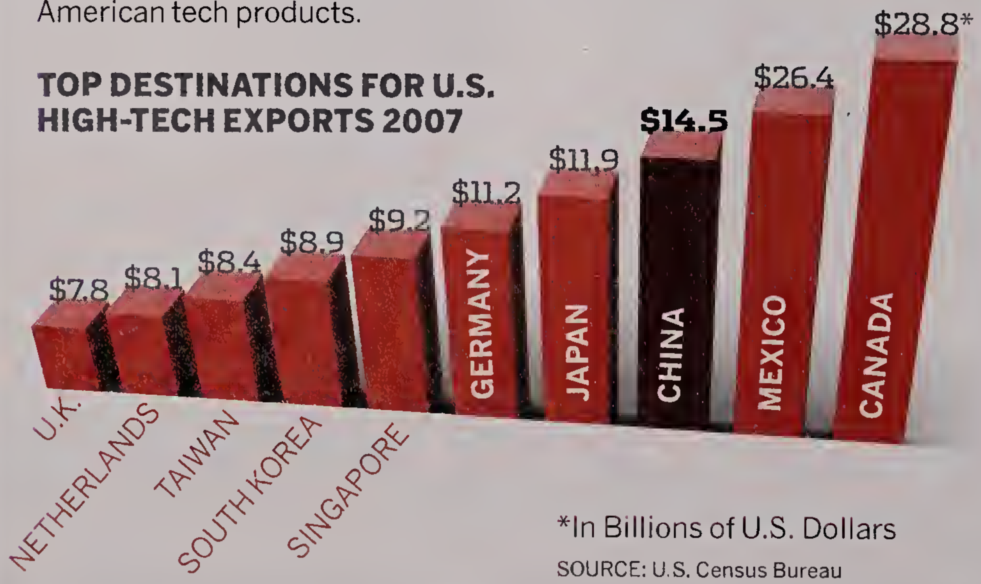
Vendors will provide tools for business users to build a mash-up on their own with no programming experience, says the report. But Young says IT will need to ensure that the tools are easy to use and that existing systems are structured to let users pull information seamlessly.

"IT has to enable the data sources," he says. "When that happens and the technology matures, we can see business users start to drive the train." *–C.G. Lynch*

CHINA Ranks Third for U.S. Tech Exports

TRADE U.S. high-tech goods exported to China more than doubled between 2001 and 2007, rising from $5.7 billion to $14.5 billion, according to the American Electronics Association. Only NAFTA partners Canada and Mexico are larger export destinations for American tech products.

TOP DESTINATIONS FOR U.S. HIGH-TECH EXPORTS 2007



*In Billions of U.S. Dollars

SOURCE: U.S. Census Bureau

Skills Gap

Continued from Page 15

integration toolset and the announcement of a business process management offering demonstrate further expansion and SAP's desire to pull all these applications together and allow them to work seamlessly.

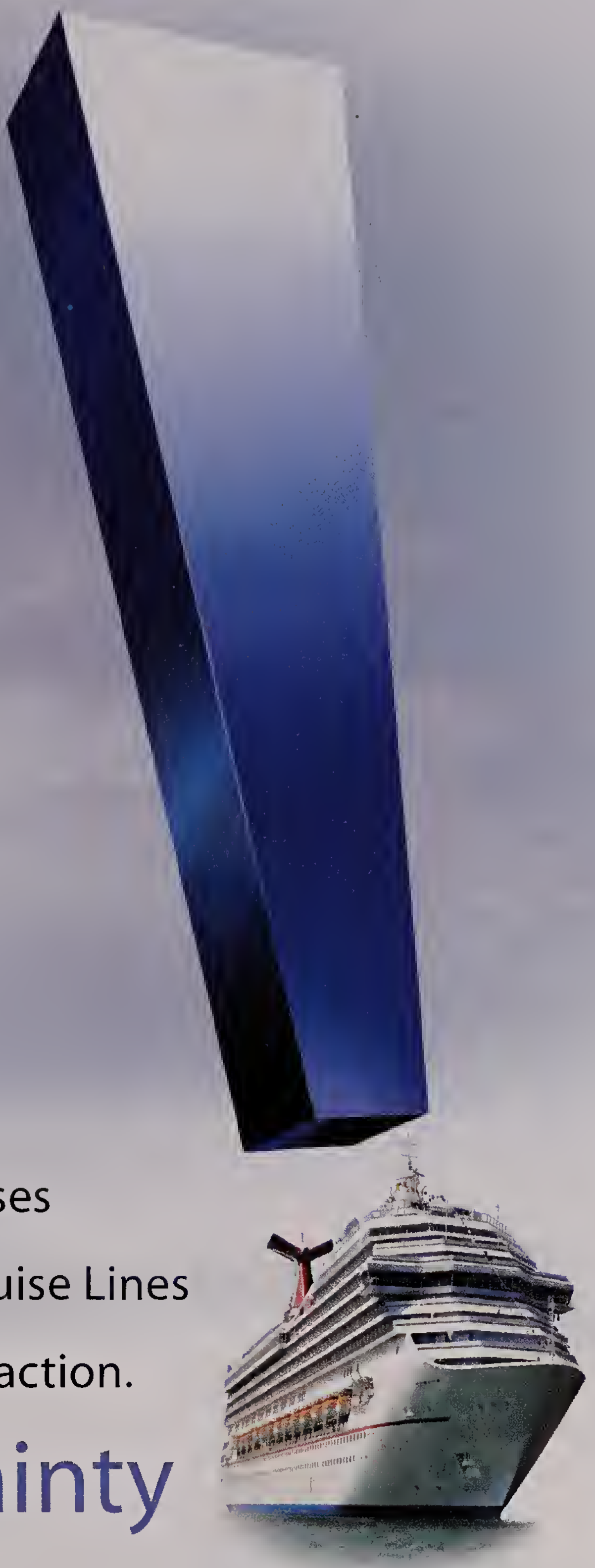
In addition, SAP's push into small and midsize businesses has expanded its scope and penetration into new customers' IT environments. Foote Partners notes that the SMB segment now accounts for two-thirds of SAP's installed base.

"The combination of these strategies and SAP's obvious success and large, installed base can only cause disruptions in the skills market because it's a well-known fact that jobs and skills acquisition lag new product introductions," notes Foote.

However, the SMB market brings its own unique set of challenges. "This segment has different staffing behaviors than large companies," Foote notes. SMBs simply can't pay the high salaries for employees with in-demand skills, nor is it economical to hire expensive consultants. As a result, the SAP skills shortage will most likely force IT shops to "accelerate the learning curve internally" as they try to cultivate SAP skills in-house, explains Foote.

Foote says the skills shortage could influence companies' decisions not to upgrade SAP installations or add capabilities with additional SAP products and services.

"SAP's story is one that we've seen countless times before: high-tech companies as victims of their own success," Foote observes. "With this skills shortage catching up with them, they are publicly acknowledging their dilemma and starting to pursue initiatives to reduce customer stress levels." *–Thomas Wailgum*



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Virtual Worlds Project Failure Rate Is High

COLLABORATION Nine out of 10 businesses that have launched virtual worlds saw them fail in 18 months or less, according to a recent report from Gartner. The report faulted companies for getting hung up on the technology rather than thinking about how people use it.

"Businesses have learned some hard lessons," says Steve Prentice, vice president and fellow at Gartner. "They need to realize that virtual worlds mark the transition from webpages to Web places, and a successful virtual presence starts with people, not physics."

The adoption of virtual worlds for the enterprise began picking up steam this year, buoyed by the success of Second Life, a 3-D environment in the consumer space where people interact with one another as avatars (virtual representations of themselves). Other consultancies, such as Forrester, predicted that virtual worlds would rival the Internet in overall importance to businesses.

Many companies implemented virtual worlds to help with internal collaboration, including Sun Microsystems, whose MPK20 provides a virtual extension to the company's corporate campus in Menlo Park, Calif. (Read "Companies Explore Virtual Worlds As Collaboration Tools" at *www.cio.com/article/180301.*)

Despite the high failure rate, the research, which was released at the Gartner Emerging Trends Symposium/ITxpo 2008 in Barcelona, Spain, did indicate that virtual worlds will catch on as companies understand what types of use cases work best for implementing them.

By 2012, around 70 percent of organizations will have set up private virtual worlds, Gartner predicts. Virtual worlds set up for employees to collaborate internally will have a high success rate because of "lower expectations, clearer objectives and better constraints."

The other upside to virtual worlds for the enterprise: cost. According to Gartner, the cost of implementing a corporate virtual platform averages $50,000, and cheaper trials can cost $5,000. The report argues that this low cost will encourage more experimentation by businesses. *–C.G. Lynch*

CIOs Reap Realignment Benefits

ON THE MOVE In May, three CIOs earned promotions amid management realignments at their companies:

At **AmerisourceBergen**, senior VP and CIO **Tom Murphy** was given additional responsibility for the pharmaceutical company's multiyear process improvement project, including a new ERP system.

Flowers Foods, a maker of supermarket baked goods, made CIO **Vyto Razminas** a senior VP.

Don Nelson was promoted from VP of capabilities development to CIO at graphic design services provider **VistaPrint**.

Vyto Razminas

The realignments will position each company for growth and, in AmerisourceBergen's case, to also streamline its organizational structure.

CIOs are well-positioned to benefit from organizational realignments, says Paul Groce, the leader of executive search firm CTPartners' CIO practice. CIOs oversee technology for all functions inside the company, he says, so they have a firsthand view of how IT can "drive huge efficiencies" by aggregating and consolidating disparate finance, HR and supply chain systems. Such changes can be the catalyst for new organizational structures. "The CIO can be the enabler of the realignment," says Groce. "If the CIO of a multinational, multidivisional company can convince everyone that compliance, HR and financial systems can run on a single platform, the CEO may decide to consolidate."

Groce says it wasn't possible to achieve such efficiencies in the past because the technology wasn't mature enough to support such realignments or companies' reporting requirements. "Ten years ago such a move would have created confusion. Today you can truly supplant the layers, the redundancies in management and in geographies with technology, he says. The result: Other people move out and the CIO moves up. *–Meridith Levinson*

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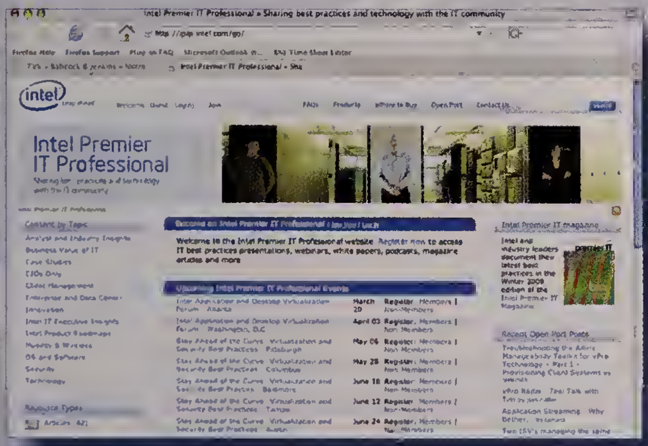

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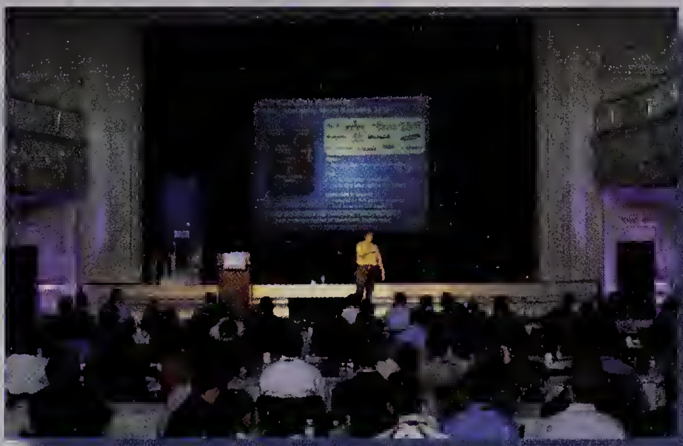

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The courtroom brawl between Oracle and SAP regarding TomorrowNow continues. But the alternatives to traditional software maintenance fees aren't going away.

The Deal With Third-Party Maintenance

BY THOMAS WAILGUM

SOFTWARE MANAGEMENT | It's the annual budget item that CIOs can't shake. It's the sacred cash cow for enterprise software vendors. It is, of course, the maintenance fee. A software vendor's maintenance and support fee on each license, usually 20 percent to 25 percent of the net license price per year, delivers bountiful margins that annually replenish the coffers of vendors such as SAP and Oracle. Analyst estimates say recurring maintenance fees can account for nearly 50 percent of most application vendors' total revenue.

The fees are, quite simply, a gift that keeps on giving.

"Maintenance is the most profitable part of the business," says Ray Wang, a principal analyst at Forrester Research. "Because by year four or five [of the software contract] there's 60 percent to 80 percent profitability just on maintenance alone."

For those on the other side of the deal (the customers buying the software), the onerous economic realities can be head-scratching. Typically, companies buy enterprise software packages every 10 years. At an annual rate of 20 percent to 25 percent of the license purchase price, by year five companies have bought the software again—and

ILLUSTRATION BY ANASTASIA VASILAKIS

that's just to maintain the application, says Wang. "In 10 years, you're buying the software twice over."

Nevertheless, enterprise software vendors are reluctant to alter any part of this arrangement, which has been going on for decades. And earlier this year, SAP quietly announced that for all new customers as of Feb. 1, the company was phasing out its Basic Support offering (which, at 17 percent, was a bargain for many companies). Instead, new SAP customers now have to purchase its Enterprise Support plan, priced at 22 percent.

At the same time as SAP is raising prices, there's a messy legal battle between SAP and Oracle regarding third-party maintenance firm TomorrowNow. The case continues to get uglier and raise some tough questions. Some IT leaders are left wondering: What's the future for third-party maintenance firms such as Rimini Street and NetCustomer? Will I be stuck with the fees that SAP and Oracle dictate? Absolutely not, say leaders at Rimini and NetCustomer.

Most customers still believe that they are not realizing enough benefits for what they're paying in license fees.

Inside the Legal Drama

When SAP made its licensing change, there was no formal or public announcement from the German software giant. "This probably wasn't one of those things where SAP wanted to make a big deal or make a large announcement about it," Forrester's Wang says. "Usually when people raise prices, it's not something they want to talk about."

What SAP and Oracle having been talking about, via their lawyers in a courtroom, is third-party maintenance—the IT leader's only alternative to those inescapable maintenance fees.

In mid-April, more details emerged from new court documents filed by Oracle and SAP in their year-long legal dispute regarding allegations that SAP illegally accessed Oracle's customer support systems. At the center of the furor: Did SAP's subsidiary, TomorrowNow, a provider of third-party maintenance support for Oracle's stable of business applications, engage in "systematic, illegal access to—and taking from—Oracle's computerized customer support systems," as Oracle's 2007 lawsuit alleges?

Oracle claims that as a result, "SAP has compiled an illegal library of Oracle's copyrighted software code and other materials," the suit states.

The legal drama has not helped TomorrowNow's prospects as a viable company. SAP put TomorrowNow on the block in late 2007, and TomorrowNow had an operating loss of approximately $35 million in 2007.

But will the claims in Oracle's lawsuit resonate with a jury? We'll have to wait on that answer until the companies present their sides to a jury—if the case even goes to trial. (A new trial date has been set for 2010; the case was originally scheduled for early 2009.)

However, many interesting legal and liability questions relating to software agreements have been raised in the lawsuit.

One of the more important is a query that SAP poses in its response to Oracle's overall claims: "Do the licenses between Oracle and its customers prevent TomorrowNow from access to that software to provide third-party support?"

Q&A: Rimini's Seth Ravin

In May, Seth Ravin, president and CEO of Rimini Street, announced the addition of support for SAP's R/3 application suite, starting in early 2009. Here's a taste of what else he told *CIO* recently about the future for Rimini and the market. For the full interview, see *www.cio.com/article/333313*.

***CIO*:** Is there a fundamental change happening in how companies purchase, integrate, maintain and support enterprise software?

Ravin: I think we are at a big change. What you're seeing now is the evolution of where customers are taking control of software as part of their asset pool and making decisions about how long they're going to run it, where they're going to run it, and they're doing it on their company time scale versus when the software vendor has, for years, attempted to dictate.

I always go back to that wonderful Jiffy Lube example. For years, you had to change your car's oil every 7,000 miles. Jiffy Lube comes along and says, "Let's double the number of appointments by just telling everybody it's 3,000 miles." That's great marketing!

In the software world, [the vendors] always have to move your company forward to the new release, so they sell upgrades and consulting. And the only two areas they make money in are consulting and maintenance. But you're seeing companies saying now: "You're not going to dictate to me that I'm going to have to give up my software every three to four years because you say I have to when it's still a performing asset." *—T.W.*

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Buyers have many questions about how the Oracle case relates to the third-party maintenance business.

Trouble for the Upstarts?

The market turbulence from unanswered questions like this one and others raised in the court documents could ultimately hurt the business prospects of third-party maintenance providers that support—for half the price—Oracle's cache of acquired application sets (PeopleSoft, J.D. Edwards and Siebel).

Three of the more well-known third-party maintenance providers are TomorrowNow, Rimini Street (which has been wooing TomorrowNow customers dissatisfied with SAP's intentions to sell off TomorrowNow) and NetCustomer (which offers maintenance services from a 24/7 global support center in India).

TomorrowNow and SAP representatives are embroiled in the dispute and have repeatedly declined to comment on anything related to TomorrowNow.

NetCustomer's chairman and CEO, Punita Pandey, acknowledges that, due to the lawsuit, the third-party support market is "under scrutiny and there's a lot of interest lately," she says.

In the Oracle v. SAP court documents that have been released, the lingering issue seems to be: If a third party is providing maintenance on the customer's code (which is Oracle's), then how can that third-party provider not "touch" the code at some point in the process? And how does that match up with the software licensing agreement?

Pandey says that "people keep making a big deal about 'touching the code.'" However, she points out that most enterprise software implementations have a "medium to high degree of customizations before a customer can use it," she says. "In more cases than not, companies use a third party to assist them with the implementation and customization processes." And that third party may have touched the code at some point.

"Now it's very hard for me to imagine what licensing agreement between a company and its software vendor, whichever one that is, says that you cannot use anyone else to touch this software," Pandey says. Her point, of course, is that third-party maintenance providers act in the same capacity—just at the other end of the software lifecycle.

David Rowe, Rimini Street's vice president of global marketing and alliances, points out via e-mail that Oracle's complaint noted "that they don't have a legal problem with third-party support—just some of the alleged processes and procedures that TomorrowNow was using."

In fact, Rowe says that Oracle has acknowledged that "third parties can get software and updates for clients," he says. "However, they are alleging that TomorrowNow went out of bounds and took more than the client was entitled to receive."

Safety Nets for Customers

Still, potential buyers have many questions about the Oracle case and how it relates to the third-party maintenance business, Pandey notes. "You can imagine that a lot of the customers are also hesitant right now."

One of the first things that NetCustomer's team makes clear is that "we do not download anything on our servers and our systems, because [the code] really belongs to customers," she says. "They download everything that they're entitled to from their vendor, whether it's from Oracle, SAP or any other vendor."

Maintenance Maverick

How will the software market change in the next few years? Get Rimini Street CEO Seth Ravin's take, in **THE MAN BEHIND HALF-OFF MAINTENANCE** at **www.cio.com/article/333313**.

CIO.com

57 percent of IT leaders say that a fair maintenance fee should fall below 16 percent of license costs. **They actually pay about 26 percent.**

SOURCE: Forrester Research

According to Rowe: "Rimini Street, as we have commented previously, has safeguards in place to keep such issues from occurring in its operations."

In the end, is all that has happened to TomorrowNow a one-time transgression, or an indicator of more legal troubles to come in the third-party software maintenance business?

Forrester's Wang thinks it is the former. "This is still a great business to be in," he says, adding that despite efforts by the major vendors to improve customer satisfaction, response times and upgrade benefits, most customers still believe that they are not realizing enough benefits for what they're paying in license fees over a typical 10-year contract period.

Contact Senior Editor Thomas Wailgum at *twailgum@cio.com*. To comment on this article, go to *www.cio.com/article/341763*.

Building a Framework for Success with Business Continuity

The ability to seamlessly, continuously operate a business in an era of instantaneous communications across globally connected networks is paramount to market success. To that end, disaster recovery and business continuity have emerged as strategies no organization can do without. Too often on the front lines of everyday business, however, good intentions and working plans get sidelined. Whether caused by complacency, a lack of IT knowledge or inadequate funding, many companies find themselves unprepared for a sudden disruption—or data loss that could prove crippling, if not fatal.

There are no easy answers. Managing disaster recovery and business continuity can stretch budgets, fray nerves and leave IT executives pondering how to get the most out of available resources. But with recovery time objectives (RTO) and recovery point objectives (RPO) shrinking and budgets stagnant, business and IT decision makers must cope with the possibility that systems can fail—due to either human or natural causes–-and that there's no time for shipping tapes, transporting people and putting all the pieces back together again.

To be sure, it's an entirely different business environment than in times past. Today, organizations must keep servers, Web sites, and databases running in the face of adversity—all while making data accessible to those who require it at the time they need it. As the president and CIO of a major IT consulting firm puts it: "It's all about moving past the old world, break-fix mentality and investing the money and time to build a strategic model."

Disaster Recovery: Perception versus Reality

Although disaster recovery has always played a key role in keeping a business operating, the events of 9/11 created a sense of urgency that transformed IT and the enterprise. A few years after 9/11, the massive New York City blackout and Hurricane Katrina in New Orleans and the Gulf Coast reinforced the importance of backing up and managing data. To be sure, the threat of data disruption and loss seemed tangible and real. An organization lacking protection risked seeing its most valuable assets disappear in an instant.

Unfortunately, within many firms, urgency has often faded to complacency. An IDG Research Services survey of 100 respondents from the corporate world found that executives rated their companies, on average, a B- in terms of preparedness for a human or natural disaster. Remarkably, 38 percent did not give themselves a passing grade for human-caused disaster recovery (such as power failure, terrorism and hack attack); 43 percent reported they were not prepared for a natural disaster (such as a storm, earthquake or hurricane); and 68 percent lack the necessary preparation for a pandemic (such as avian flu, SARs or a yet unidentified disease).

While these grades are not dropping—they are consistent with the numbers reported in 2007—they illustrate a gaping hole that exists within most organizations. Too often, CIOs and other IT executives wind up planning for the last disaster rather than anticipating the next one.

Still, the threat remains a very real one. For instance, seven in 10 respondents in the IDG Research survey have experienced a serious network outage; just more than half have endured a hardware failure; and slightly less than half have dealt with a significant power failure. In addition, just more than four in 10 have faced an application or operations error. Natural disasters, too, present challenges—though, not surprisingly, the number of organizations affected by various events varies. In 2008, less than 20 percent of respondents faced a hurricane, flood, earthquake, or tornado.

A decade ago, most organizations could continue to operate in the face of a network outage. Telephones and faxes allowed conversations and essential exchanges to take place. Unfortunately, that's no longer the case. As one CIO for a major building and construction company puts it: "We have so many satellite locations, and so much data that's being gathered in so many locations in the field and then transmitted back to the corporate offices, that protecting our data aggressively and in real time becomes our primary objective." Further complicating matters for many firms: If a supplier or business partner suffers an outage, the problems can ripple throughout the entire supply chain.

IT executives increasingly recognize that disaster recovery is more than a patchwork of backup systems and software for restoring data. It's essential to have an optimized, efficient and comprehensive solution in place. And the challenges aren't limited to tight budgets and corporate priorities. Infrastructure management, sponsorship, policies, testing, training, change management, enterprise support, customer requirements, and workflow all enter into the equation. Without taking into account the sum of these factors, it's impossible to build and maintain a system that can stand up to the hardships of today's business environment.

The bottom line results are significant. Only 4 percent of respondents in the IDG study indicated they were "extremely confident" in their business continuity preparedness. Less than one-third were "very confident" and about 45 percent reported they were "somewhat confident." These numbers, while indicating that organizations are addressing business continuity issues, show that CIOs and other IT executives need to pay closer attention and take a more comprehensive approach to managing and protecting enterprise data.

Coping with a Changing Business Environment

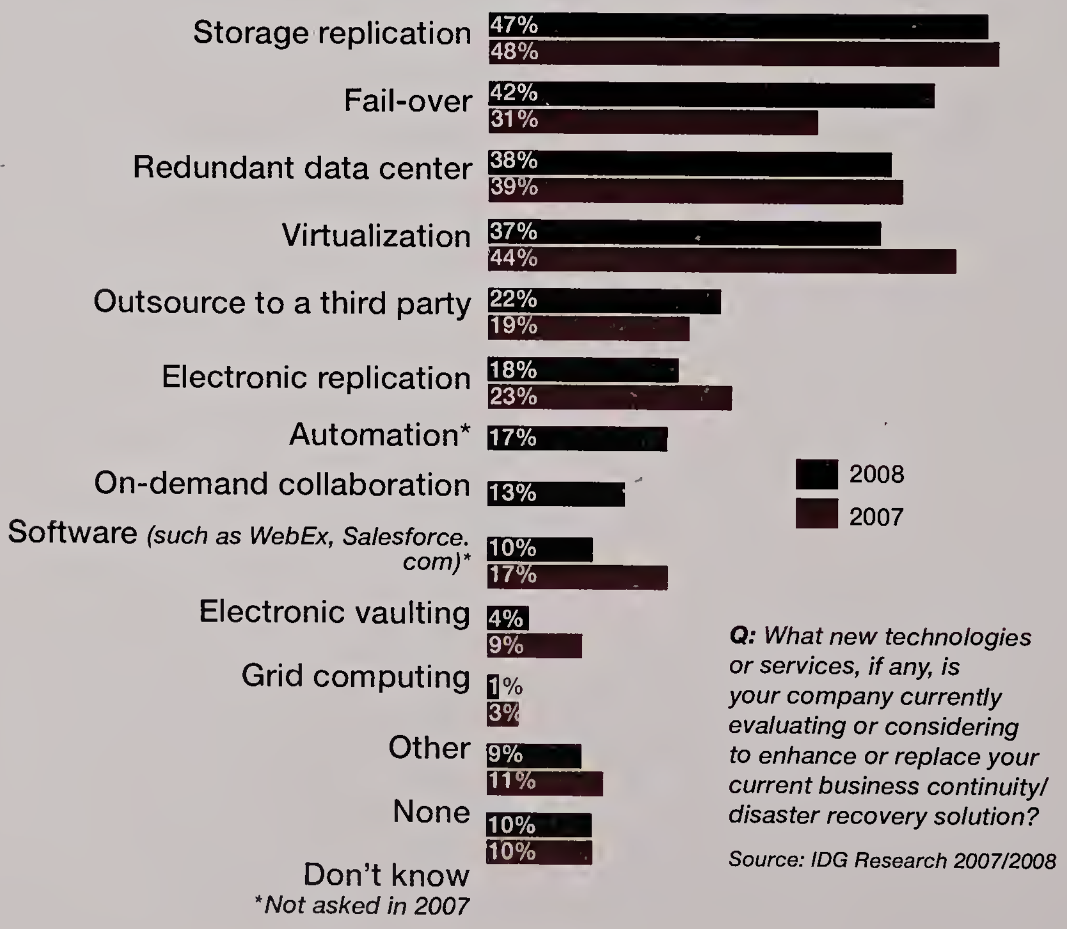
It's no secret that performance pressures are growing. Fifty-four percent of organizations now face an RTO of less than 12 hours, 75 percent have an RTO of less than 24 hours, and nearly 100 percent have established an RTO of 48 hours. IT executives expect the windows to decrease in the coming year; nearly two-thirds think they will have a four-hour or less RTO in place by 2009, and 98 percent are looking at a 24-hour RTO window within the same time frame.

As recovery time objectives shrink from days to hours and recovery point objectives become more critical, organizations must seek more efficient ways to tackle disaster recovery and business continuity.

The common denominator is that organizations are now examining how to enhance or revamp disaster recovery and business continuity services already in place. In fact, the IDG study found that 81 percent of organizations are considering changes. Leading areas of focus include storage replication (47 percent); fail-over (42 percent); virtualization (37 percent); outsourcing to a third-party provider (22 percent); electronic replication (18 percent); automation (17 percent); electronic vaulting (10 percent); and grid computing (4 percent). These results were mostly in line with findings from 2007.

Among the more promising of these technologies is virtualization. It enables an enterprise to optimize system performance through load balancing, boost system reliability and availability, and lower the overall costs associated with disaster recovery and business continuity. Virtualization creates a more

Which services are clients considering?



*Not asked in 2007

Q: What new technologies or services, if any, is your company currently evaluating or considering to enhance or replace your current business continuity/disaster recovery solution?

Source: IDG Research 2007/2008

efficient environment by reducing the load on servers during backups, optimizing resources by running a single software agent on a proxy server rather than installing and managing the application on every machine across the enterprise; and making it possible to utilize Fibre Channel tape devices and virtual machine backups.

Of course, virtualization alone can't transform an organization; it is merely one piece in the business continuity puzzle. Its value is enhanced within organizations that rely almost entirely on Intel-based and AMD-based systems, which provide support for virtualization features and technology. Legacy systems, including mainframe and midrange computers, can pose enormous challenges since they aren't able to run virtualization. This can translate into difficulties virtualizing data from major applications, including enterprise resource planning (ERP), supply chain management (SCM), and manufacturing resource planning (MRP) on legacy systems.

As a result of today's highly complex data environment, many organizations are also taking a close look at managed services.

Any array of other tools and technologies are also making their mark, including virtual tape systems, storage area networks (SAN), networked attached storage (NAS), Internet Small Computer System Interface (iSCSI), and continuous data protection (CDP), which automatically saves a copy of every change made within e-mail, documents, databases, logs, and various other types of files. However, installing and integrating these systems—and keeping them up to date—can challenge even the most tech-savvy organization. More than a few CIOs have found themselves straining under the weight of constantly evolving technologies and rapidly changing business conditions.

Building a Better Model

The end goal, of course, is to provide uninterrupted access to critical data. As a result of today's highly complex data environment, many organizations are also taking a close look at managed services. This approach offers a high level of customization along with consulting expertise. It also lets an organization outsource the management of hardware and software used to run backups and restorations. For many companies, this approach is cost-effective and thwarts problems, interruptions and breakdowns.

An advantage of turning to a managed services provider is that it can develop a business continuity plan and ensure that an organization has the right resources in place. The approach also reduces IT capital expenditures while reducing—if not eliminating—the need to build and maintain separate data centers, along with all the hardware and software required to keep them running effectively. A good managed services provider, with geographically dispersed facilities, makes it possible to reconnect to data after a disruption—without substantial travel and adjustments.

The best managed services providers offer recovery services (including systems recovery, trading services, end-user recovery, voice recovery, and mobile recovery); network services (including routing, bridging and re-direct); software tools for building a strategic plan and enhancing the decision-making process; and testing services that detect errors, speed up the recovery process, avoid downtime, and ensure data availability and integrity.

This approach can reduce risk and maximize return on investment. And it fits with today's disaster recovery and business continuity environment. IDG Research found that 65 percent of the firms surveyed report competing priorities, 41 percent lack the necessary personnel to implement and manage systems, 32 percent face technological limitations, and 29 percent suffer from little or no management support. For many organizations, moving to a managed services strategy—with a qualified provider—not only makes sense it also helps manage dollars more effectively. It essentially transforms an IT and business burden into a competitive advantage.

Choosing the right managed services provider isn't a task to be taken lightly, however. It's essential for a company to have adequate network capacity, ample bandwidth, redundancy, hardened facilities, and a track record for success. At the same time, expertise and consulting experience determine whether an infrastructure delivers on its promise or suffers critical failures at inopportune times. A managed services provider must operate at the lightning-fast speed of today's business environment and ensure that the solution fits the enterprise platform.

The road to effective disaster recovery and business continuity isn't likely to get easier in the foreseeable future. However, with the right planning, preparation, training, technology, and processes, an organization can position itself for success. Make no mistake, a sound business continuity strategy is no longer an option; it's an absolute necessity. In today's high stakes global economy, it can determine whether an enterprise flourishes or flounders. ::

For more on business continuity, including the research report mentioned in this article, please visit the Sungard solution center at www.cio.com/solution-centers/sungard.

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GEORGE E. STROUSE

Hire for Alignment

If there's still a gap between the business and information technology, you need people on your staff to understand business better

Are you having problems with alignment? Is your IT staff unable to provide the business with the support it needs? Does it seem as if your IT staff just doesn't understand the business? Perhaps they don't.

For years, authors and top-ranked CIOs have complained about business and IT alignment. That chorus of concern, coupled with the ongoing presence of alignment as one of the top 10 information management concerns expressed by IT leaders every year, indicates that the problem of aligning information technology with business goals and processes is much deeper and more fundamental than we realize.

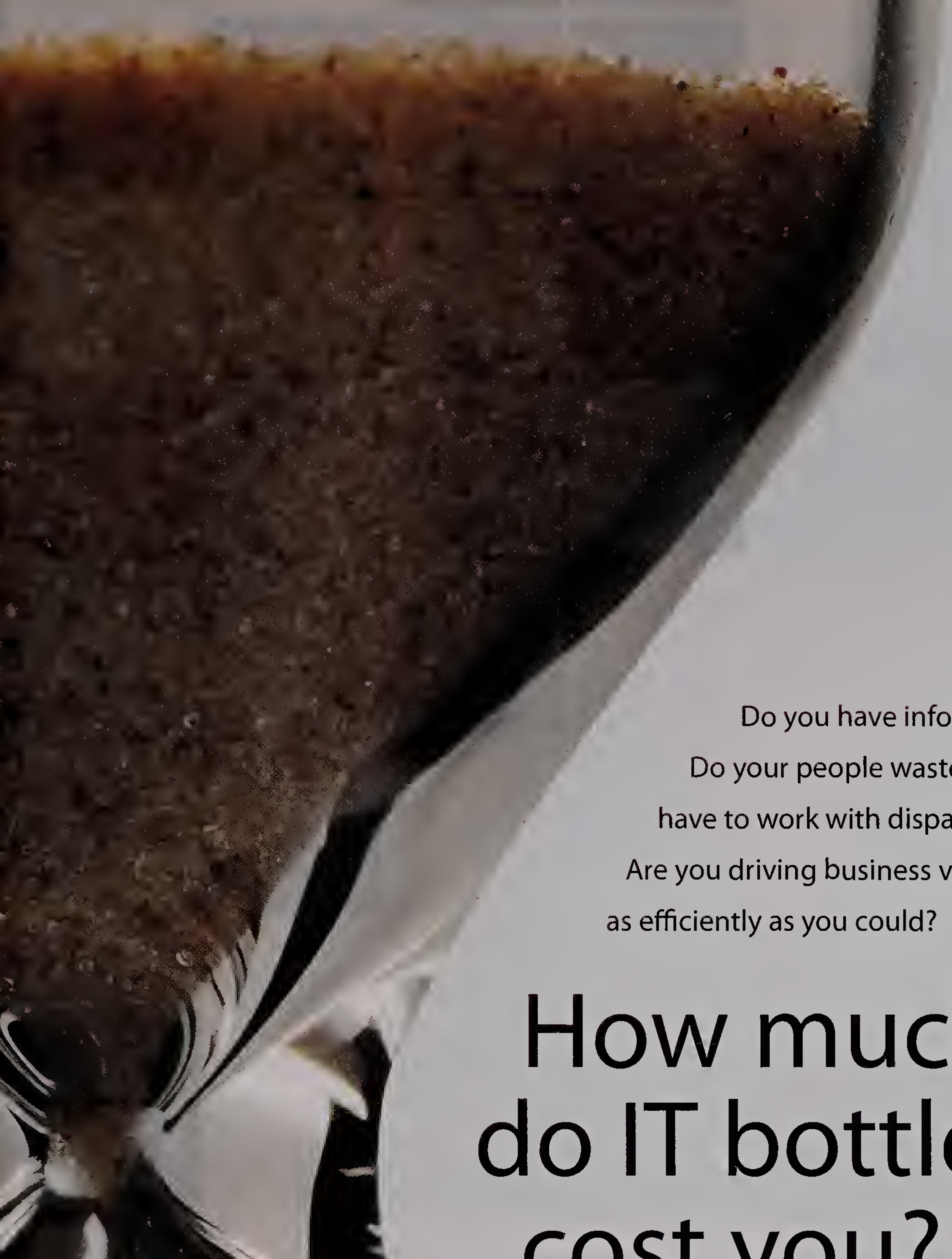
A Hiring Mismatch

The real problem underlying the IT-business alignment conundrum is that we're not hiring the right people in IT. The right people need strong backgrounds in both business and technology. Most IT hiring managers place too much emphasis on strong technology backgrounds.

A recent CIO.com article, "Why Business Analysts Are So Important for IT and CIOs" (*www.cio.com/article/336213*), depicts how critical it is to have a meaningful combination of both business and information technology know-how. It identifies the most successful business analysts (for example, the ones who most effectively apply IT in business environments) as those who possess the ability to "communicate, facilitate and analyze" not technology but business.

In addition, the article propounds the idea that these positions "tilt more toward business functions such as operations, marketing, finance or engineering."

But while the article hits the nail directly on the head when identifying the capabilities that will enable your staff to "turn business-requested, IT-delivered applications into tomorrow's dynamic business applications," it fails to address why these individuals are difficult to find.



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The reason? They're hard to find because businesses are simply not asking for them.

A Question of Degrees

Job postings for business analyst and business-related IT positions specify that the candidate should possess a degree in computer technology or computer science. The problem with that degree requirement is that computer science and technology degrees don't require business courses. How can you expect alignment to occur between business and IT when the technology staff has no business training or background?

The answer is clear: You can't.

Let's take a look at computer-related degrees. There are two broad areas: One is computer science, and the other is information systems. Although the two are often lumped together under the heading of computer technology, they are vastly different at both their core and their objectives.

> **An IT staffer who doesn't know the difference between debit and credit transactions can't be expected to support accounting and finance.**

Simply stated, the computer science degree focuses on the science and development of technology, while the information systems degree focuses on how to support business through the application of information technology. While the information systems degree is replete with business courses on such topics as financial accounting, economics, marketing and business strategy, the computer science degree has none of these requirements. You can't expect alignment of IT with business needs when many on your IT staff may never have had even one business course.

Build Business Smarts

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An IT staffer who doesn't know the difference between debit and credit transactions can't be expected to support accounting and finance. Similarly, IT departments can't align and support extended value chains when the staff has never heard of CRM, SCM or JIT.

If IT professionals have never had a management, marketing, accounting, finance or operations course, it isn't hard to understand why they don't understand your business needs. When you examine the requirements for the computer science degree, exactly where in your business alignment needs do you fit the requirement for not having a solid understanding of business?

Graduates holding either degree have many opportunities for employment in a wide variety of organizations and positions. In fact, Bill Gates recently asked the federal government to raise the H-1B visa quota because there's a lack of qualified technical expertise in the United States. Whether one agrees with him or not, enrollment in computer-related college programs is down. If Mr. Gates wants more "qualified technical expertise," then Microsoft should be advertising for, focusing on and hiring people with computer science degrees.

Make the Right Hires

If you and your organization want business and IT alignment, you need IT people who have a strong understanding of business as well as information technology. You should be hiring IT professionals with information systems degrees for those positions. If the demand for information systems degrees begins to appear in job requirements, the supply will surface to accommodate the need.

To be clear, I am not advocating that businesses hire only people with information systems degrees. Many positions require strong computer science backgrounds, such as those in process control, computer integration, networking, telecommunications provisioning, artificial intelligence, and some Web and graphics applications.

However, organizations of all sizes need information technology people who can communicate in business terms, elicit business requirements, develop and implement business systems, support business analysis (financial, marketing, operations/production and forecasting, for example), understand market segments, conduct statistical business assessments, and possess the skills to analyze business opportunities for risk and impact on operations. Above all, they need people who understand business well enough to attempt alignment.

To increase the probability of alignment, to optimize your opportunity for business success and to reduce the gap between business and information technology, you need your best assets: the right people. Don't continue to decry IT's inability to understand business needs, to deliver functionality on time and within budget, or to understand business strategy and alignment unless you have actually hired the right people for the right positions.

George E. Strouse is a professor of information systems at York College of Pennsylvania. He is a former CEO, CIO, business owner and consultant. To comment on this article, go to *www.cio.com/article/353363.*

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The Secrets of Early Adopters

BY STEPHANIE OVERBY

Four CIOs share their techniques for moving fast with new technology

THERE HAVE BEEN EARLY ADOPTERS--AND LAGGARDS—probably for as long as there has been new technology. Surely, when the first wheel was rolled out in 3000 B.C., just a handful of Mesopotamians had enough insight and risk tolerance to give it a whirl while others looked on from a safe distance.

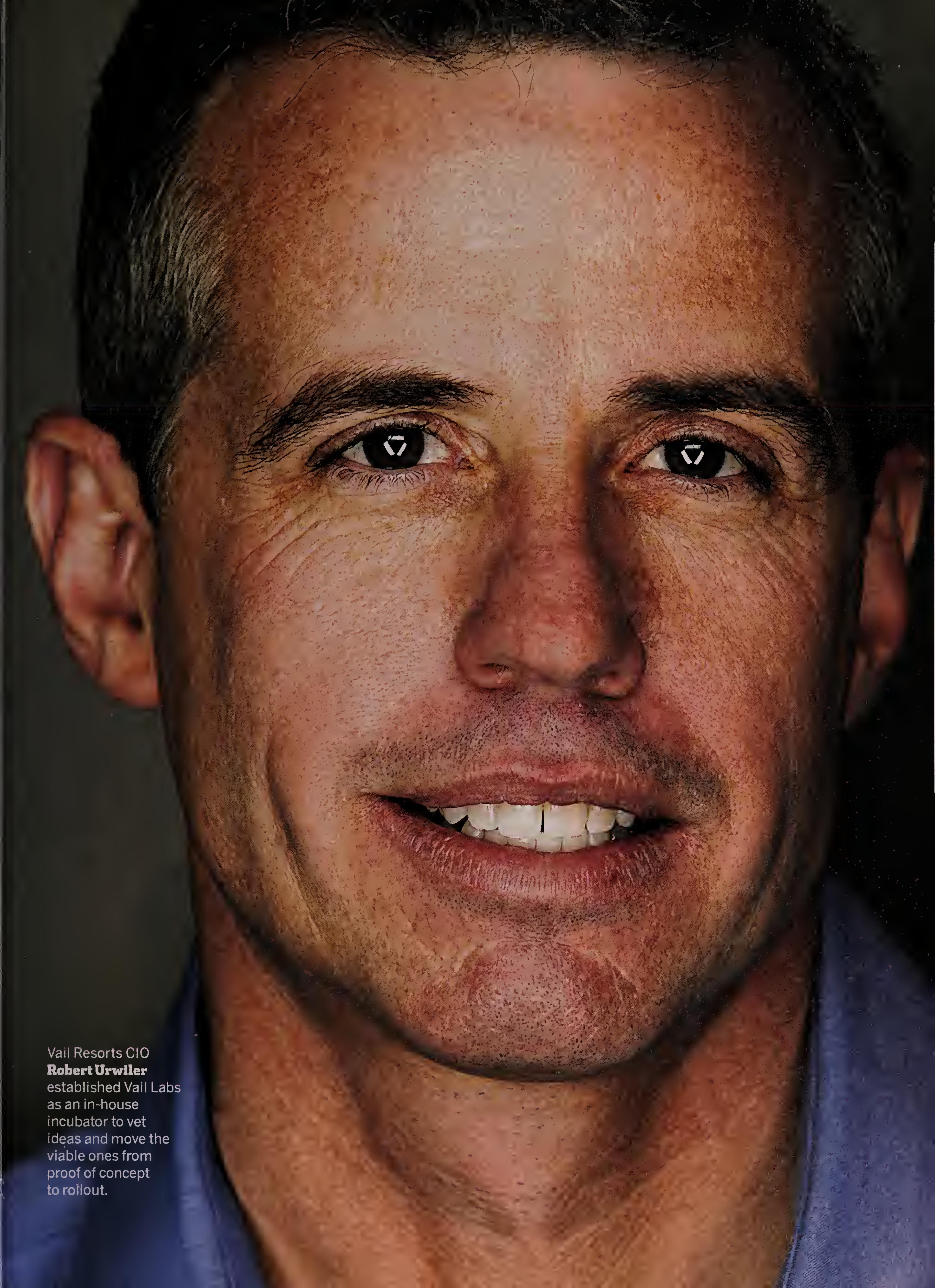
Not much has changed. That brave soul willing to embrace The New still sits in the same spot on the bell curve that Everett Rogers drew up back in 1962 to denote what he called the "diffusion of innovation"—just after the innovator but well before the early majority, the late majority and the laggards.

But within corporate IT, watching early adopters as they stumble isn't necessarily the safest course anymore. The pace of technology change has increased so much that corporate IT leaders who don't embrace emerging trends at some level risk ending up behind the competition. Gartner produced 70 "hype cycle" documents (analyses of new technology adoption trends) covering 1,500 new technologies last year. What's more, it's easier than ever to take new tech-

Reader ROI

- :: Why you can't wait to adopt new technologies
- :: Processes for testing and deploying emerging applications
- :: Ways to mitigate risk

PHOTO BY DON CUDNEY



Vail Resorts CIO **Robert Urwiler** established Vail Labs as an in-house incubator to vet ideas and move the viable ones from proof of concept to rollout.

nologies for a test drive.

"Sometimes you can do it in your office in an afternoon," says Matt Brown, a principal analyst and research director with Forrester Research. "You can set up accounts and test out some new collaborative technology in a matter of hours before making a full commitment to it." Some emerging technologies, such as Google Apps, the iPhone and many open-source applications, don't even require a full enterprisewide rollout—at least not in the old, big-bang fashion—to get real value out of their implementation. Then there's the fact that anyone, not just people in the IT department, can, and will, try out the latest tools, whether or not CIOs sanction them.

Adoption of new technologies has spiked as IT has evolved from the complex tools, centralized systems and transaction-based software to the lightweight tools, abundant information and ubiquitous network-centric software that's taking over the marketplace today, says Brown. As a result, early adoption of emerging technology is no longer limited to tech-centric companies or those with pockets deep enough to absorb the risk. CIOs in industries ranging from health care to car manufacturing see piloting and testing lesser-proven technologies as a critical part of their role.

"Ten years ago, CIOs spent a lot of time getting transactional systems—the giant stuff—in place. But that's not so much the job anymore," says Robert Urwiler, CIO of Vail Resorts. "CIOs have more freedom to explore innovative ways to provide business transformation and more freedom to look around at emerging technologies. I feel like I have an *obligation* to do that." If Rogers were to revisit the idea of early adoption in IT in 2008, that classical distribution curve might not look so bell-shaped anymore.

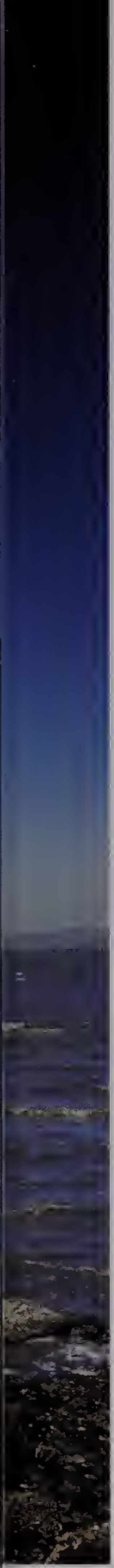
But none of this means early adoption can't be difficult and costly if it isn't managed well. Four CIOs who have mastered the art of early adoption today share methods that work for selling new technology to the business, for creating repeatable processes to shepherd new ideas into practice, for determining the potential benefit of new systems and for creating flexible ways to roll out emerging tools.

At Virgin America, emerging technology must improve productivity or keep costs low, says CIO **Bill Maguire**.

VIRGIN AMERICA:
PUT EMERGING TECHNOLOGY—AND RISK—IN BUSINESS TERMS

Talk to Bill Maguire long enough and he could convince you he came out of the womb embracing emerging technology. "For as long as I can remember, I've always been out there looking at

PHOTO BY SHANNON MCINTYRE



new technologies, figuring out how to exploit them," Maguire says. "I'm diligent about trying to keep up and have a good degree of confidence in my ability to do so."

Maguire's history as an early adopter contains successful and, well, less-successful chapters. As the CIO of Legato, Maguire was one of the first IT executives to implement VoIP in 2001, saving the company more than $3 million. The year before, running the U.S. Postal Service's primary data center as manager of customer operations, his organization was among the largest—and earliest—users of VMware in the country. A decade earlier, Maguire had introduced to the USPS one of the first virtual storage solutions in the country, StorageTek's Iceberg disk-array storage subsystem.

That didn't turn out as well.

"We brought two of the big storage units in house, and [the vendor] made a big splash," Maguire recalls. "It was bleeding edge." It was also very complicated. What should have been up and running in a few weeks took months to get online. "Once we got it, it put us way out in front," says Maguire. "But it took three times longer than expected."

Nothing has dampened Maguire's enthusiasm for technology innovation, though. "I'm a glutton for it," he says. Today, however, Maguire knows the right questions to ask in order to evaluate the business risks. "You have to understand your environment very well," he says. "Then you have a good idea of whether a piece of new technology will really work for you or not."

At Virgin America, where Maguire landed as CIO two years ago, that has been easier than at previous companies because Maguire built the architecture from the ground up. Yet risks still lurk in Maguire's tech choices from the edge.

Virgin America's application stack is open-sourced to the hilt, from spam filtering to load balancing to document management. Although open-source enterprise systems aren't yet a mainstream tech choice, it makes good business sense because it enables the carrier to keep IT costs down. But because the company is growing (it now runs about 100 flights a day) there's concern whether these free or cheap solutions will scale. "With spam filtering, when you're getting a couple thousand e-mails a day, it's no big deal. But when you start getting 20,000, can you handle that?" Maguire did scalability pretesting, but it's something he must monitor as the company expands.

Plan to Innovate

Dannon CIO E.J. Hutchinson writes about **HOW HIS TEAM STAYS ON THE LEADING EDGE** at **www.cio.com/article/354613.**

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Maguire doesn't fall for emerging technology just because it's new. At Virgin America, new technology must either improve productivity or keep costs low. Successful deployment starts with making sure company leaders understand the business case and the risks associated with less-tested solutions. Maguire might begin by telling them in basic terms what load-balancing software Ultra Monkey actually does. He then explains his thinking behind the open-source option: It costs $3,500 per server versus a non-open-source option at $90,000 per box. A more extreme example is the free, Web-based document management solution Knowledge Tree, one of the first open-source enterprise content management systems, which Maguire says took only a few hours to roll out companywide. The tested, commercial option more familiar to business leaders—Documentum—would have cost an estimated $1 million. Finally, Maguire gives Virgin's leaders a risk assessment for each new system—from low to extremely high—and the criteria he used to make the assessment.

It's amazing what a dramatically reduced price tag does for the business's willingness to take a chance on new systems. "They'll at least give you a few months to try it out," he says. But not everything makes the final cut. Maguire tried out a free, open-source CRM solution from OpenCMS. And he got what he paid for. "We gave it a whirl. It didn't have the true functionality we needed in a CRM solution." Virgin America will probably opt for another open-source option, Maguire says, once the company has defined the requirements for it. (He's considering on-demand vendor SugarCRM.)

Maguire's biggest aides when assessing the risks of emerging technology are also his biggest doubters: the business systems analysts. "They're technically knowledgeable, but also understand the business," he says. "And they're the most conservative because they know whether something is really going to meet business requirements. They don't have time to goof around with products that don't solve a business need."

VAIL RESORTS:

THE SEARCH FOR THE NEXT BIG THING

Vail Resorts' Urwiler and his team of 110 think of themselves as technology innovators because they *don't* work in a tech-centric business. "All technology innovation comes through the IT team so that has to be part of our core competency," says Urwiler, who previously worked at software maker Macromedia. "It doesn't mean we're always going to be the very first user of software, but it does mean we're always on the lookout."

From his perch a mile high in Broomfield, Colo., Urwiler explores everything from social networking tools to mobile device applications to biometrics, looking for emerging technology that might

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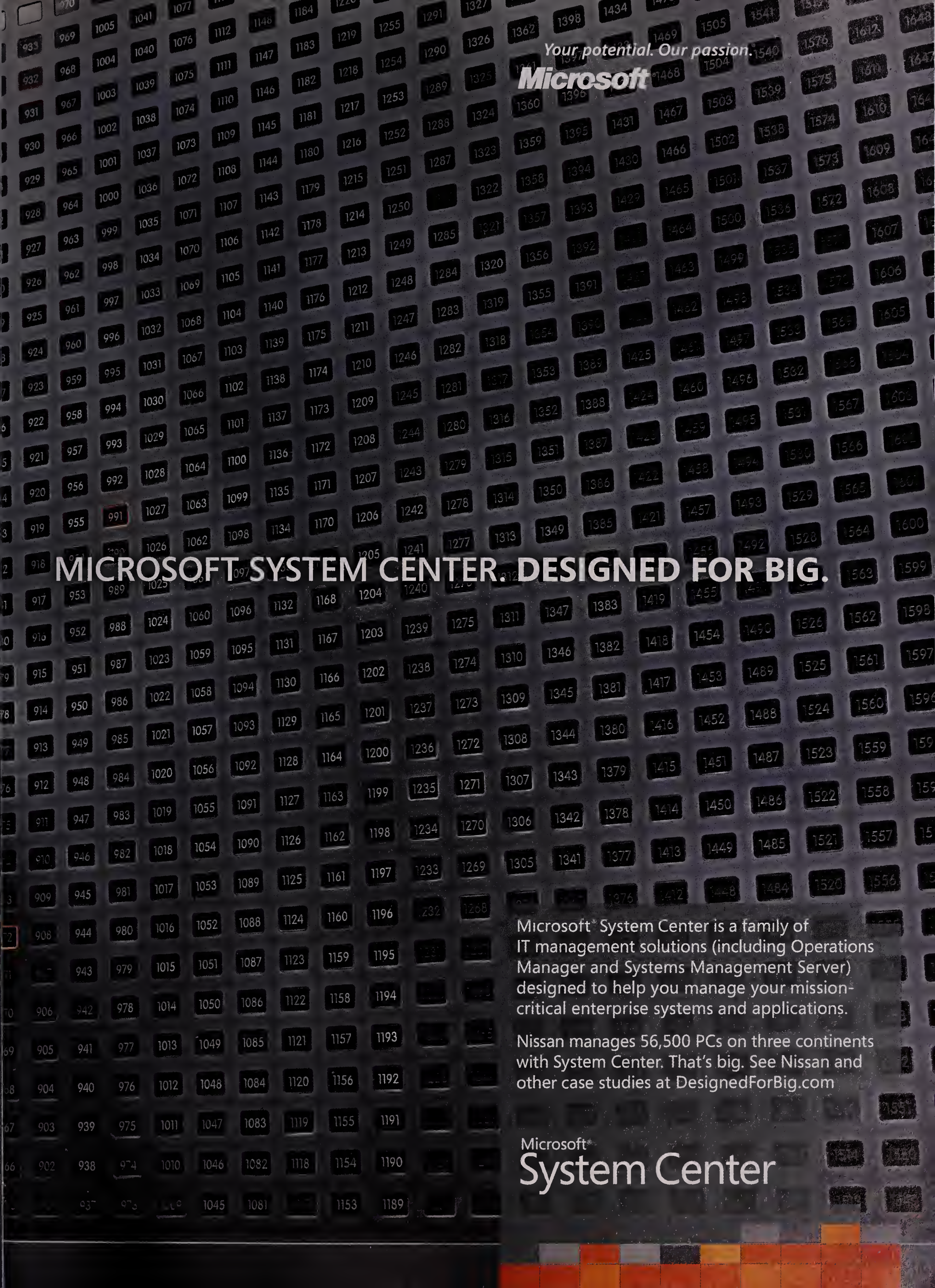

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be brought to bear at the company's ski mountains in Vail, Beaver Creek, Breckenridge, Keystone or Heavenly. He works closely with vendors to identify emerging trends, keeps his ears open at conferences and talks to his peers. And he encourages his team to keep abreast of the latest IT tools. "Ideas come from every place," Urwiler says. The best ones are those that can provide competitive differentiation for Vail Resorts by improving the guest experience.

When Urwiler explores new technologies, he worries most about the potentially negative effect on the end customer. "Once we set an expectation about a new tool, it has to work," he says. "We are very cautious about what we expose to a guest. This is the vacation of the year for some of them." Urwiler doesn't want to be the one to ruin it.

To manage the flow of new ideas and make sure only technologies that will improve the guest experience get the green light, Urwiler created Vail Labs. It's an idea incubator for vetting ideas and moving those with potential value from proof of concept to rollout.

The RFID guest tags Vail Resorts will roll out next season started there. Urwiler's team looked at biometric passes being used at some theme parks, which are based on finger geometry and involve scanning people's hands. The Vail Resorts team determined that scanning hands wouldn't work in the heavily gloved and layered ski environment, but the RFID component of such a system had promise.

Vail Labs fielded a proof of concept on the slopes, bringing mountain operations staff into the process. "Early on, there's always a natural skepticism. You're dealing with operations people who are very good at what they do. IT comes in with grand ideas about how to improve that, and there's a show-me mentality." For a pilot last season, 1,000 patrollers and ski instructors wore RFIDs while Vail Labs logged information on usability. The system, which got the go-ahead, uses an RFID chip on a lanyard (like the bar-code ski passes Vail Resorts had employed for years) that can be scanned right through a jacket.

The Vail Labs process is also designed to weed out solutions that aren't ready for mountain scrutiny. If a new tool fails to meet requirements for usability and reliability, if there are concerns about the vendor or if the cost-benefit analysis doesn't add up, the technology never leaves the lab.

Seven Tips for Success With Emerging Tech

1. **Give business leaders** a layman's tutorial on the role of any emerging tool or process.
2. **Make sure the larger organization** understands the risk of any new technology and what went into your risk assessment.
3. **Invite more conservative members** of the IT team to weigh in on emerging trends. They may have technical insight to prevent costly mistakes later on.
4. **Test unproven technology** on a few hundred IT guinea pigs before you conduct larger corporate pilots.
5. **Create a repeatable process** for shepherding new ideas from proof of concept to rollout that will also weed out technologies that aren't ready for prime time.
6. **Harness the energy of early adopters** in the business and broadly publicize their success with the tools.
7. **Consider segmenting your user base** and wait to deploy emerging tools to less-adventurous users until they're ready.

–S.O.

Last season, Urwiler looked at a friend-finder application for mobile devices. Urwiler had an agreement with the vendor whereby Vail Resorts would pay through a predefined usage model only after the technology proved usable. "The proof of concept was brilliant. There was a lot of excitement around it." The pilot wasn't so thrilling. The application, intended to enable skiers to locate each other via GPS, did not meet the reliability threshold. Urwiler and team are still hopeful in making the solution work. "But because we took a conservative approach to it, we had very little money invested," says Urwiler. "It was low risk."

GENENTECH:

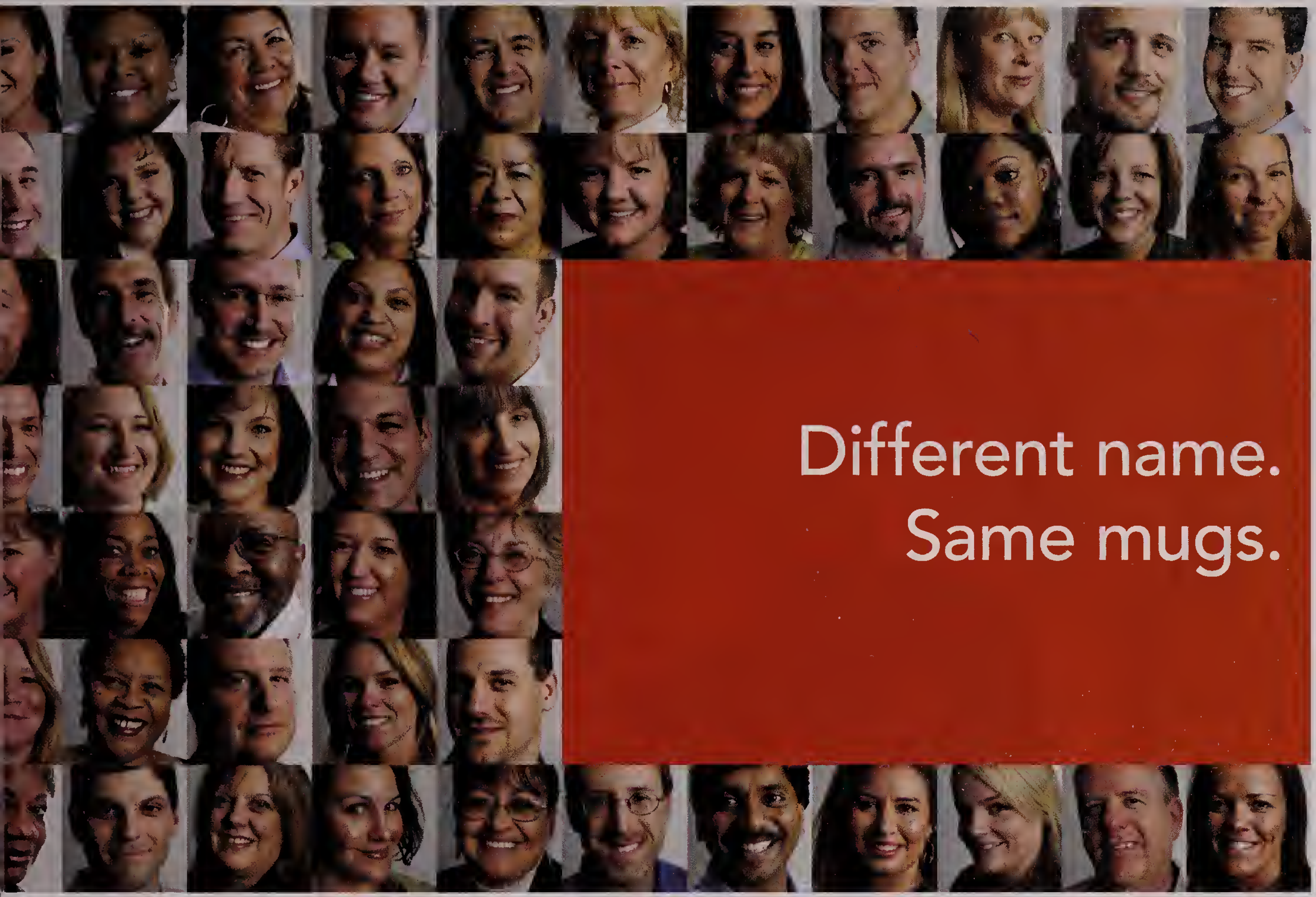
CONTROLLED CHAOS AND THE SCIENTIFIC METHOD

"I have a high level of comfort with paradox and ambiguity," says Todd Pierce. "That helps when talking about new technology."

That's a bit of an understatement from the VP of Corporate IT of Genentech, who's currently overseeing piecemeal rollouts of Google apps and iPhones—and who several years ago installed a cellular data service network and Wi-Fi access campuswide. "A lot of being successful is figuring out what tensions—what paradoxes and conflicts—to hold," Pierce continues. "Combining what's possible with what's practical—holding that tension—determines how successful I am as CIO."

Cycling in the latest innovative technology is truly an exercise in controlled chaos for Pierce, who sees his primary role to be figuring out how fast to deploy emerging technology to gain the ultimate benefit. Which, Pierce notes, turns out to be a pretty tall order with new tools being introduced at a faster rate than ever before.

The scientific approach of a biotech company, currently exploring new treatments for cancer and autoimmune disease, is boon and bane for IT. It's an innovative bunch, for sure. "But that scientific mentality makes it very easy for them to question what you're doing," says Pierce. "People here are very willing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to try new things, but it can't just be new. It has to be new and better. And you have to prove it."

Pierce evaluates any new technology on a host of dimensions: Who can he serve with it? How reliable and efficient is the tool and associated processes? How much does it cost? How does it impact IT's relationship with the business? At what scale can he deploy it? And what is its life cycle?

The company was using 5,000 mobile telecommunication devices, including BlackBerrys, last year when the iPhone hit the market. The average consumer who bought it right away may have seen a sleek, new mobile phone to add to a growing gadget collection. But Pierce saw a business solution. Genentech deals with a lot of image-based data, but no one could imagine accessing it with the devices they were using. Pierce saw the iPhone's multitouch interface—which allows users to flip rapidly through photos by merely "flicking" a fingertip on its screen or to resize a photo by "pinching" the image with two fingers—as an enabler for a truly mobile Genentech workforce.

He tempered his excitement with a five-month study last year, for which he gave iPhones to a group of mobile device users on his IT staff. He observed adoption rates and conducted three user surveys. Eighty-five percent of users preferred the iPhone. To date, Pierce has rolled out 3,000 of them.

The key for Pierce is that he doesn't have to get to full consensus before rolling out an emerging solution. Ideas are floated. Tests are run. The cross-functional group of five VPs that oversee IT strategy and prioritize projects will argue back and forth about which emerging technologies should be deployed more widely within the organization. But at a certain point—once everyone's concerns have been considered and the potential value of a technology has been validated—says Pierce, "I become the decision maker."

It's not as scary as it sounds. "We have a CEO who would rather be fast and make a mistake and recover from it than be slow and miss something," Pierce says. Plus, Pierce doesn't see the embrace of emerging technologies as an all-or-nothing proposition. "We don't have to do everything all one way, or wait for all the factors to line up," he says, "A lot of decision makers get caught in that trap."

Instead, Pierce segments his user base. Not everyone needs an iPhone. Maybe Google apps aren't a good solution enterprisewide. "There are cultural barriers when you have this much diversity of talent," says Pierce. "So we're breaking things down into smaller segments and asking, Is this segment worth servicing in this way? We're allowing for more personalization, more customization, more choice."

That approach doesn't work all the time. "It's tricky with technologies that require you to enter at scale. You can't phase your way into SAP," says Pierce, referencing Genentech's biggest IT investment of all time. In fact, there are more than a few products and uses of emerging technologies Pierce hasn't found to be successful during his six years as CIO. Web access controls, portals, rules engines, content management systems—none of these made it much past the pilot stage. "What these things have in common is that they have too much complexity and require too large of an investment to implement and maintain," Pierce says. "(They) will probably be replaced by less-expensive and less-complex solutions."

With Google apps, however, Pierce started out with 100 users. He now has 1,000 people using the software, at just $50 a head. And Pierce can justify a bigger rollout based on the benefits of the calendaring system alone. If any of the other applications show value, it's an added bonus.

How to Decide When New Tech Is Worth Trying

Early adoption of emerging technology is no longer limited to tech-centric companies or to those with deep pockets. But CIOs must be smart when embracing less-tested tools. Here are 10 questions to ask before taking the plunge.

1. How does this solution fit into my existing environment?
2. What is the business benefit (even if I can't prove an ROI yet)?
3. What are the risks?
4. Can I explain this technology to my CEO in 30 seconds or less?
5. Do I know who will use it?
6. Can I test it without business disruption and without spending lots of money?
7. Is the vendor stable?
8. Will this solution scale?
9. Does my staff have the expertise to manage it?
10. How will this emerging technology affect my customers or suppliers? *-S.O.*

DANNON:
THE ART OF MODERN MAINSTREAMING

Any organization can play with cool new things," says E.J. Hutchinson, CIO of the Dannon Company. "They key is figuring out which ones will actually drive business value and mainstreaming those into the organization."

To make the cut at Dannon, a "cool new thing" has to help the company make more money, increase market share or improve efficiency. Once Hutchinson's team proves an emerging technology is worthwhile, the real work begins—rolling it out to the workforce and creating new business processes to get value from it. Mainstreaming it, in other words.

"Mainstreaming is when the business sees the solution or tool as something they wish to use, day in day out," Hutchinson says. Of course, mainstreaming isn't what it used to be—a dictate

E.J. Hutchinson, CIO of the Dannon Company, encourages end users to try new tools and suggest ways to redefine business processes.

from IT about which tools thou shall and shalt not use. Today it can mean having to support several generations of technology for some users until the larger universe of them catches up. And it's particularly tricky given Hutchinson's diverse workforce.

"The workers coming out of school today have only had the Internet," Hutchinson says. "The way I hate having to write a letter and go to the post office to send it, this generation feels the same way about e-mail. They'd rather use IM, SMS or avatars." Meanwhile, he adds, the adoption cycle from research to rollout, which used to take years, is compressed to a year or even less.

Hutchinson is figuring out the best methods for fast and effective mainstreaming of new tools with the rollout of Dannon's

PHOTO BY WEBB CHAPPELL

massive, multimillion-dollar Unified Communications and Collaboration (UC2) project. It's one of Dannon's five strategic IT projects today. UC2 encompasses not only a leading-edge, unified communications component (whereby calls and e-mail and video conferences can transfer from a business phone to a cell phone to home to hotel without interruption, for example) but also the exploration of Web 2.0 tools such as wikis, blogs and technologies with capabilities similar to those provided by Facebook and Second Life, which have seeped into the mainstream of many people's personal lives, but which remain unproven in the enterprise. Voice and data convergence won't be widely adopted for a couple more years, according to Gartner, and telepresence collaboration (technology that enables users to feel as if they are together with remote colleagues) is five to 10 years out.

> "Ten years ago, CIOs spent a lot of time getting transactional systems in place. That's not so much the job anymore. We have more freedom to look around at **emerging technologies.** I feel like I have an obligation to do that."
>
> –ROBERT URWILER, CIO, VAIL RESORTS

A consumer products company may seem an unlikely candidate for leading the charge toward unified communications and collaboration technology. "The bulk of our advantage is in product differentiation," admits Hutchinson. "But communication in this company has gotten so complex that e-mail and phone just aren't cutting it."

Jim Panos, Hutchinson's director of informing and innovation for the Dannon Company, along with CTO of Danone North America Mike Close, conducted a UC2 pilot within IS. They didn't encounter any interoperability issues, because Dannon had been diligent about adopting standards-based technology in the past. Concerns about network capacity were solved with some additional investment in the network backbone and network traffic management. At a corporate leadership event, Dannon IS/IT highlighted some UC2 capabilities—a wiki for month-end financial closes and a video-conference capability for monthly business unit updates that could replace costly executive travel. Top business executives were sold on the value of UC2 right away.

Dannon is about halfway through a rollout that could take another six months to a year. Panos has found that audio and video conferencing usage spikes shortly after these tools are given to new users. But, Panos points out, "there's a difference between adopting capabilities and institutionalizing them. The challenge is to take those tools and redefine business processes. How do you use conferencing in coordination with social networking tools to take communication to the next level?"

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Mike Ryan & Brian Day (from left to right)

Panos and Close have been working with the business to answer those questions. Following the executive team presentation, they solicited early adopters to join the pilot. "There's a huge upside because people are inventing and innovating in their own personal lives," says Panos. "You can leverage the consumer side of technology."

One HR leader started interviewing candidates by teleconference instead of flying them to North American headquarters in White Plains, NY. Finance figured out a way to use a collaborative website to eliminate the mega e-mail files they'd send around during a close. "You can't underestimate the value of putting these tools into people's hands early," says Close. "The business folks innovated with the tools. They'd say 'I get it, but can I use it to do this?' That's where it takes off." Then Hutchinson spreads the word. He uses a wiki to share progress with business units. He is working with his parent company, Groupe Danone and a network of regional business and IT leaders who share their UC2 approaches and concepts.

Differing adoption rates persist, however. Just as voice mail has not been eradicated by e-mail, IT leaders don't expect the UC2 tools to replace all existing communication technology. "Both methods have to be there for a while. We're going to have wikis and blogs, but some people will still [feel] comfortable with more traditional methods of communication," says Panos. "We say, 'Here's another possible way to do things.'"

The approach may seem ad hoc, but there are some guiding principles in place. Before moving ahead with any new UC2 application, Hutchinson's team needs some positive responses to a handful of questions: Is the solution scalable globally? Does it look like it will have a positive midterm return? Will it work with existing equipment? Is the vendor going to be around to support it? Are other companies using the solution?

It can make ROI calculations tricky, though. Beyond reduced travel costs and some increased productivity calculations, the payoff of UC2 is a little amorphous—increased quality of communication and work-life benefits for employees, for example. So Hutchinson measures success for the project differently, by tracking usability, adoption rates and employee feedback. The ROI is long term, and senior leaders get it. "[UC2] supports sustainability. It gives back time," Hutchinson says. "Those are soft benefits, but ones that are on the minds of executives today."

Next, Hutchinson's team will explore how other emerging communication and collaboration tools—intelligent search, streaming video on mobile devices—can take UC2 even further. "I don't see a point where we'll be done," says Hutchinson.

"I fundamentally believe what John F. Kennedy said: 'Change is the law of life. And those who look only to the past or present are certain to miss the future,'" he adds. "We're not going to be bleeding edge, but we're always going to be early."

Senior Editor Stephanie Overby can be reached at *soverby@cio.com*. To comment, go to *www.cio.com/article/394663*.

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Dashboards that Work

Bringing all business metrics under one umbrella at three distinct levels is the key to success

Mike Corcoran, CHIEF MARKETING OFFICER, INFORMATION BUILDERS
Corcoran is responsible for working with the executive management team of Information Builders to develop and communicate corporate and product strategy. He has more than 15 years of experience in the software industry.

Good dashboards monitor your business. The challenge is creating dashboards that give an overview of business activity, highlight circumstances that require attention, and provide information that leads to action—all on a single screen. Information Builders has overcome that challenge by developing dashboards that integrate enterprise data, reach any application and deliver scheduled and on-demand access to information that addresses changing business needs.

Good dashboards monitor your business.

How do dashboard strategies differ from organization to organization, and person to person?

Typically, dashboards and Business Intelligence are used at three levels within organizations—strategic, analytical and operational. Senior management uses strategic dashboards with consolidated, highly summarized information and key performance indicators. Analysts use dashboards with data visualization technologies to help them understand the relationships in large volumes of data. At the operational level, dashboards support real-time applications that provide instant customer information for call center agents, and provide field employees with business-critical information they can share with customers.

How do organizations develop a dashboard strategy that maps to all dashboard users?

It takes a great deal of cooperation and vision on the part of senior management, which must establish a clear, consistent set of goals to govern the rollout of dashboards. Companies that do this properly succeed by mapping those goals down to every individual operational area. This kind of comprehensive approach provides the best opportunity to overcome any internal cultural resistance or other barriers. In fact, some of the most successful dashboard strategies come from companies that are challenged by government standards or other demanding mandates, because they have no choice but to act.

How do Active Dashboards impact corporate dashboard strategies?

Active Dashboards deliver information to remote and mobile workers, enabling them with alerts and quick snapshots of push information, as well as other more substantial data they could not normally access without links to a server, database or the Internet. This allows them to analyze large stores of data through a dashboard-type interface that can be formatted for PCs, full-size Web PC browsers, or specific mobile devices. It also allows organizations to ensure that only authorized users have access to sensitive data.

What is the best overall strategy for successful dashboard deployments?

Although there is a natural inclination for organizations to concentrate on the use of dashboards by finance departments, the most successful organizations want to fully understand all their business metrics because they realize, for example, that financial performance is also impacted by operational metrics.

Do you have a good example of a successful dashboard user experience?

The Hillman Group is a midsize company that manufactures and distributes screws, fasteners and bolts that are sold around the world. In order to meet its global obligations, the company developed a finely honed supply chain and global distribution organization that spins off a wide range of metrics that are displayed on dashboards at the strategic, analytical and operational levels of the organization. This strategy has made it possible to react quickly to product line changes, streamline revenue reporting, and more fully enable business users. As a result, Hillman more efficiently identifies and fixes problems, and has quickly realized hard-dollar returns on its dashboard investments.

FOR MORE INFORMATION:
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Social networking tools promise to help companies harness the knowledge inside the heads of their employees and put it to work for the business

BY

MICHAEL FITZGERALD

Hurricanes are hell on knowledge management. Take it from Giora Hadar, a knowledge architect at the Federal Aviation Administration (FAA).

These powerful, swirling storms can wipe out navigational aids, air traffic control equipment and radar dishes that ensure the safety of commercial and private aircraft in the U.S. They can also sever communications and keep critical information from flowing between FAA workers on the ground and those based in D.C. and elsewhere. In 2005, hurricanes Katrina and Rita did all this and one thing more: They spurred the FAA to start developing social networking tools to address communication and knowledge management challenges even during extreme circumstances, such as a Category 5 storm.

At the FAA, hurricanes and other disasters raise a fundamental and urgent knowledge management question: Who's available to get things up and running again? "We need to reach our people to find out, Are they OK?" says Hadar, who supports the FAA's disaster recovery efforts. "We also need to know where they are and if they are available to participate in the recovery."

Once everyone is accounted for, the agency needs to figure out which disaster recovery specialists will do what, and who their counterparts are at other federal, state and local agencies. The specialists themselves have to track their e-mails and instant messages, voice mails, the documents to bring equipment back online and what they spend.

It's a perfect situation for taking social computing tools—such as online social networks and group communications tools like wikis and keyword tagging—

Reader ROI

:: Why social computing helps with KM

:: How IT leaders are testing the waters and putting them to work as a form of knowledge management.

The Challenge of Knowledge Management

Those dealing with knowledge management (KM) have always faced the challenge of getting information out of people's heads and into a database. Social computing tools seem like a good way to help, since they encourage people to share their knowledge with others, and that expertise can be easily captured.

In fact, social computing represents a third wave for KM: the set of tools and processes companies use to create, track and share intellectual assets, says Patti Anklam, an independent consultant who is focused on KM and social networking. Anklam says the first wave involved digitizing and tracking documents using tools like content management systems. When it became clear that it was too hard to share those documents, companies adopted collaboration tools. With social networks, companies are extending knowledge management to make it easier to connect employees and information.

"A framework for knowledge management consists of understanding what you need to have in place so that people can connect and share with each other, and then...connect to people outside of their own current, small personal networks," Anklam says.

Not So Fast

CIOs need to strike a balance in adopting social networking

Social networks are so easy and intuitive to use that practically anyone can jump in and get started. Just ask Cisco CIO Rebecca Jacoby. "My 80-year-old mother is on Facebook," she says.

This ease of use epitomizes social networking's potential for companies that want to tap the knowledge of their workers. It also highlights a challenge for CIOs: the perception that IT isn't moving fast enough to adopt these applications within the business.

Cisco is already moving down this path. It is developing a companywide social computing platform aimed at greasing the idea process and capturing institutional knowledge by strengthening existing networks and making it easier to adopt new ones. There's Directory 3.0, its internal Facebook, with employee listings designed to identify an employee's area of expertise to enable collaboration. It has Ciscopedia, an internal document site, and C-Vision, its version of YouTube. And it has the Idea Zone, a wiki for people to post and discuss potential business ideas.

Despite these initiatives, Jacoby says IT is still perceived by business users as not moving fast enough to leverage social networks because they already use them personally. "People ask me all the time, 'Can't I just go to an ASP and create a community?'" She says they cite both the speed and the low cost of doing so. But Jacoby says that CIOs need to consider issues of privacy, data security and the ability to scale across a global organization. It's no good, she says, if 15 different business units develop 15 different online communities "that can't talk to each other."

Still, Jacoby says social networking has led IT to change how it works with Cisco's business units to develop social computing tools and set usage rules."That's a real cultural change for IT organizations, and that's way more challenging long-term than the technology," says Jacoby. *–M.F.*

Social networking tools have been used mostly by consumers but are now emerging in corporate environments. A 2007 survey by IDC (a sister company to *CIO*'s publisher) found that almost 40 percent of very large companies—those with more than 10,000 employees—were using business or social networking tools, more than 30 percent were using online communities and just under 20 percent were using social bookmarking tools. Smaller companies were less aggressive in using the tools but were also adopting them.

What's driving interest in the market? Social networking tools show clear potential for improving collaboration and sharing different types of knowledge within organizations. And employees typically are familiar with them. In fact, 25 percent of companies say that workers are already using social networking tools for work, though only 10 percent actually offer such tools, according to *CIO*'s 2008 "Consumer Technology Survey." But of those who do offer the tools, 30 percent do it to improve KM.

KM Resources

To learn more about **KNOWLEDGE MANAGEMENT** read **ABC: An Introduction to Knowledge Management** at **www.cio.com/article/40343.**

cio.com

Like the FAA, many of these companies are in the early stages of figuring out how best to use social networking tools for KM. In part, that's because "knowledge management is a business process, not a market," says Mark Levitt, an analyst at IDC. "There are a lot of processes that are tied up in knowledge management, and no single product can enable it."

Social Tools Await First Test

The FAA started thinking about how to use social networking tools in 2000, when Alan Stensland, its Eastern Service Area emergency coordinator, saw Lotus QuickPlace, a team collaboration platform, and Lotus Sametime, an instant messaging tool, at a trade show. After the 2005 hurricane season, Stensland's desire for better ways to con-

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nect his disaster recovery specialists only increased. So the FAA, a heavy IBM user, became a beta tester for what would become Lotus Connections, which includes social computing tools like Profiles (a directory of people and their expertise), Communities, Blogs, the tagging tool Dogear, and Activities (a dashboard). It also upgraded from QuickPlace to Quickr and moved to IBM's Websphere Portal.

The FAA's disaster recovery response leverages the use of these tools, which run through the Activities dashboard. Its 200 or so disaster recovery specialists invite people to join their networks via Profiles, and use Activities as a kind of electronic project bin: Voice mails, documents and their electronic receipts for a project will go into it, making it easy to track and share with other agencies, easing the hassle of post-disaster spending audits.

That's the hope. The last two hurricane seasons were mild, and no other major disasters have struck since the new tools were tested and put in place. But this summer's hurricane season is expected to be a bad one. If it is, the FAA believes it is ready to respond faster and more effectively than ever before.

Business Acceleration

Social networking tools should bring faster response time to all facets of business, says Rebecca Jacoby, senior vice president and CIO at Cisco Systems. Cisco is building a social computing platform (see "Not So Fast," Page 44) because "this is the first technology in 10 years that as a set, if utilized properly, lets you accelerate your business."

Jacoby says that Cisco sees the types of knowledge sharing these tools permit as "overarching" for business in the global era. "I can bring people from locations all over the world or different functions to participate in solving a problem or creating an innovation that allows the company to have growth," she says.

A case in point: the Idea Zone, an internal wiki where Cisco staff can post and comment on business ideas. Since it was started in June 2006, more than 600 ideas have been posted and vetted, and four new business units have been started.

A Better Way to Collaborate

Also exploring social networking is Flowserve, an industrial manufacturer of pumps, valves and mechanical seals. Flowserve's CIO, Linda Jojo, felt the company needed a better way to capture institutional knowledge and communicate it to employees across its far-flung offices: Flowserve does business in more than 55 countries, and IT has people in a dozen of them.

"We want to create more relationships within IT," she says. "So if you're in Brazil and you're running into a problem with Oracle databases, you can find the people within Flowserve who might help you." Jojo felt that a social networking application like Facebook could act as a virtual employee water cooler but she had reservations about its privacy and security.

So Flowserve built an internal version of Facebook and launched it in December 2007. The project was spearheaded by two business analysts—recent college graduates who Jojo asked to design something to bring employees together. It took them a few weeks, working part-time, to get the tool ready. Despite no formal announcement, interest in the tool has been building. About 150 of the 250 IT staff members have signed up and are using the wiki, blogs and other tools built into it. Jojo says it's too soon to say what impact it's had on the organization. But in a year or so, "I would hope to be telling you that this is a tool that we as an IT organization can't live without and it becomes an essential part of how we support the greater Flowserve organization," says Jojo.

While Flowserve built its own application, IDC's Levitt says companies have plenty of social computing tools to use, many designed to work with their current software. Vendors including IBM, Microsoft, Adobe, Novell and Oracle are adding these tools to their products. The trend began several years ago, but only now are companies starting to become comfortable with the idea.

"The average worker two years ago had never been in [an electronic workspace]," Levitt says. Now, thanks to instant messaging and social networking sites like Facebook or LinkedIn, most businesspeople are familiar with online communities.

But while users may feel comfortable, businesses remain

Knowledge from the Outside

The Web makes it possible to build markets around many things, including knowledge for hire. In a sense, that's what sites like Elance and Innocentive offer: expertise that companies bid on to expand their own knowledge. Then there are expert networks like that of Gerson Lehrman Group. GLG's knowledge marketplace connects customers to subject matter experts who can consult in person or over the phone, depending on the customer's preference. It's a broader, more consulting-oriented tool than Innocentive, which connects companies to scientific researchers with specific knowledge.

GLG says sales will hit about $220 million this year. It has a network of 175,000 consultants, and between 20,000 and 30,000 business leaders, all of whom have worked in senior management for companies with more than $100 million in revenue. Users of the service can tag the expert or documents, rate the person and add notes. The average call lasts about 40 minutes and costs about $300. Companies can subscribe to the service.

"We've taken knowledge management outside our own four walls," says Jonathan Glick, GLG's director of research operations. "It makes knowledge management an asset." *–M.F.*

uneasy. Levitt notes that tools like Facebook lack the security and privacy that corporations demand. He thinks products like Lotus Connections, which combine a number of social networking tools into familiar software and make them easier to adopt, will become more common.

A Perfect Solution?

Social computing would seem to solve some of the challenges posed by KM. But these tools come with their own set of issues for the CIO.

Workers can set up their own social networks outside the company's IT infrastructure, creating privacy and data security issues. Companies will be less able to control communications enabled through social computing, both internally and externally. And there will still be a learning curve for workers used to communicating in specific ways.

Wainhouse Research analyst David Dines says user issues will be the hardest challenge for CIOs in companies that are adopting social networking tools. "What CIOs need to ask themselves is, How are people actually using the wiki?" he says. "What kind of employee structures and policies do we have in place to encourage the proper use of these tools?"

Still, analysts are optimistic about the marriage of social computing and KM. Dines says that in 2007, enterprise sales of tools like Liveworld, SocialText and Mzinga, which offer ways to build customer and internal communities, and wikis, respectively, reached $200 million. IDC, meanwhile, projects that social networking will be a $1.3 billion market by 2012.

What seems clear is that social networking tools are poised to help businesses cut through the maelstrom of information and improve how workers share knowledge. Dines says these tools will streamline how workers research projects, form teams and share knowledge. His prediction: "Pretty soon you'll see people say LinkedIn and Facebook are interesting, but look at what we've got internally." CIO

How Social Computing Aids Knowledge Management

Social Networking Tool	How It Helps KM
Tagging/bookmarks	Help in finding documents, potential collaborators
Social networks	Easy access to relevant experts, collaboration
Wikis	Act as a database with collaboration tools
Instant messaging	Encourages sharing info and collaborating à la team rooms

–*M.F.*

Michael Fitzgerald is a freelance writer. To comment on this article, go to *www.cio.com/article/395113*.

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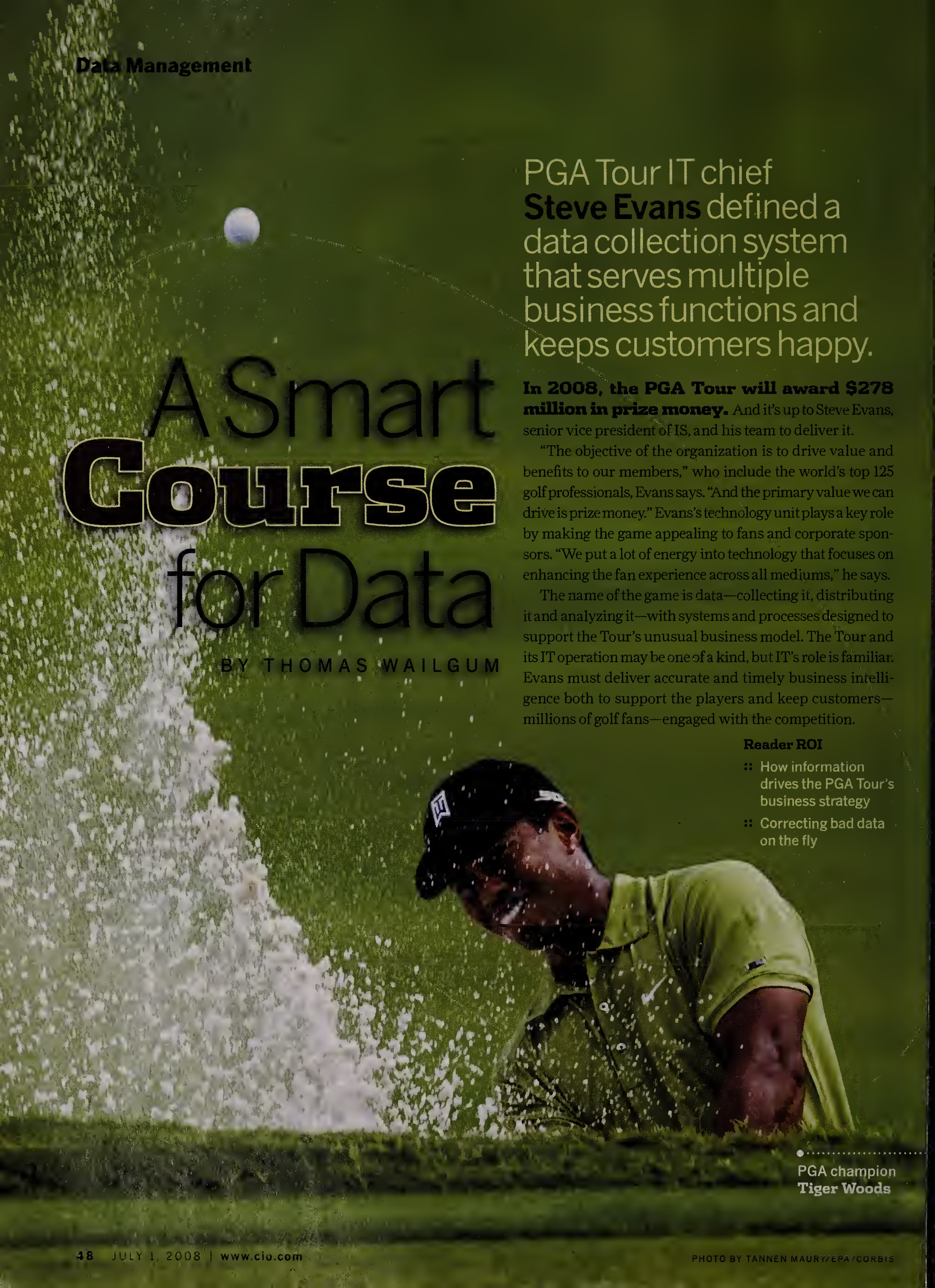

A Smart Course for Data

BY THOMAS WAILGUM

PGA Tour IT chief **Steve Evans** defined a data collection system that serves multiple business functions and keeps customers happy.

In 2008, the PGA Tour will award $278 million in prize money. And it's up to Steve Evans, senior vice president of IS, and his team to deliver it.

"The objective of the organization is to drive value and benefits to our members," who include the world's top 125 golf professionals, Evans says. "And the primary value we can drive is prize money." Evans's technology unit plays a key role by making the game appealing to fans and corporate sponsors. "We put a lot of energy into technology that focuses on enhancing the fan experience across all mediums," he says.

The name of the game is data—collecting it, distributing it and analyzing it—with systems and processes designed to support the Tour's unusual business model. The Tour and its IT operation may be one of a kind, but IT's role is familiar. Evans must deliver accurate and timely business intelligence both to support the players and keep customers—millions of golf fans—engaged with the competition.

Reader ROI

- How information drives the PGA Tour's business strategy
- Correcting bad data on the fly

PGA champion
Tiger Woods

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Desire for the Tour's data—specifically players' statistics—has dramatically increased during the last decade or so. To keep up with the yearning from the fans and players for more data and analysis on every shot of every tournament (typically 32,000 shots per four-day event), Evans and his IT crew have spent lots of time and money on technology improvements that satisfy the growing demands of each constituency.

A BUSINESS (PERHAPS) UNLIKE ANY OTHER

The Tour has a unique business model, says Evans. First, the PGA Tour is a tax-exempt member organization that wields a powerful, global brand. Second, the location of the business moves weekly from one venue to the next. Third, its operations are subject to the whim of the weather gods. What's more, the success of its main product, sports entertainment, is controlled not primarily by Tour employees but by the professional golfers, whom the Tour considers independent contractors. Finally, its core workforce isn't the 2,000 Tour employees but tens of thousands of unpaid tournament volunteers. (The nonprofit company does not disclose its revenue, though estimates place it at more than $300 million.)

Each year, the players, along with Tour staff, including 15 or so mobile IT workers, crisscross the country, where the golfers compete on the finest courses under grueling and pressure-packed conditions with millions of dollars in prize money at stake. A typical purse for a Tour event is $5.3 million, with the winner getting anywhere from $700,000 to more than $1 million.

Since the Tour serves its members, executives such as Evans back at the Tour's headquarters in Ponte Vedra Beach, Fla., need to ensure that golf fans' and corporate sponsors' interests are aligned with each other as well as with the players who are competing on the fairways and greens. Broadcast ratings, attendance at PGA Tour tournaments, merchandise sales and Internet viewership on PGATour.com are critical to raising the money that pays for the player benefits and the charitable donations made in each of the local markets.

The linchpin in the PGA Tour's business strategy is the revolutionary ShotLink system, which debuted in 2001. Shotlink tracks every shot at every event—where a player's golf ball starts and lands, and all the ground covered in between. ShotLink data generates more than 500 statistics as well as predictive analysis on golfers' games. "Our mission is to capture attributes for every shot, for every player in real time," Evans says.

Top: A volunteer uses a ShotLink unit to track golfers' shots during the PGA National in Palm Beach Gardens, Fla. **Bottom:** A volunteer records scores at the Allianz Championship in West Des Moines, Iowa.

In turn, the ShotLink data feeds PGATour.com, TV broadcasters and other media outlets, as well as the 11 high-resolution LED scoreboards that are strategically placed on the courses each week. The mobile scoreboards were introduced in 2007, and the players gave "a lot of constructive criticism" on what content they wanted to see, Evans says.

In essence, ShotLink data becomes critical business intelligence for the Tour players. "They rely fairly heavily on it," Evans says. For example, on Fridays, players need to know where the "cut line" is—the score that divides the field into those who will continue playing on the weekend and those who won't. (Players with a score worse than the cut line aren't allowed to play on Saturday and Sunday). Once the weekend rolls around, and tensions rise on Sunday afternoon, the data on the scoreboards becomes absolutely vital.

"They evaluate that [scoreboard information] as part of their decision-making processes," Evans says, "and determining the risk on their shots."

MANAGING THE TOUR'S DATA QUALITY

With millions of dollars at stake, the accuracy of the ShotLink data is paramount. Here's where the volunteer staff comes in, and where Evans has a dual challenge. He has to develop and manage a sophisticated data collection system while ensuring that it's easy for the volunteers to learn and use.

At each tournament, approximately 350 of the 1,000 volunteers onsite work in one of two assignments gathering the data to feed the ShotLink system. One role is called the walking scorer. Each group of Tour golfers has a walking scorer, who records in a PDA the attributes of each player's every stroke.

The other role is called the laser operator. Two teams of two volunteers each are strategically positioned on each of the course's 18 holes (one group monitors the fairway, the other, the putting green) and, using a special laser surveying device, locate each golf ball after it's been played and note the coordinates of its exact location on a digital grid.

Errors happen—especially with some 32,000 shots occurring during a typical four-day tournament, Evans notes. But in his estimation, it's better to have the data flowing as fast as possible. "There's no way we're going to critique every single stroke before we send it to people who use the data," he says. "We'll show you all of our flaws and errors, and we'll pride ourselves on the timeliness to fix that information."

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> Errors happen—especially with some 32,000 shots occurring during a typical four-day tournament. **But it's better to have the data flowing as fast as possible.** "We'll show you all of our flaws and errors, and we'll pride ourselves on the timeliness to fix that information."
>
> –STEVE EVANS, SENIOR VICE PRESIDENT OF I.S., THE PGA TOUR

Because accuracy and timeliness of the data are so critical to players, broadcasters and fans, Evans and his team have built a couple of features into the ShotLink system that allow for quick error resolution. If, for example, the walking scorer says a player's golf ball landed in the fairway but the result of a laser operator's survey shows that the ball was actually in the rough (thick grass), an onsite ShotLink producer will receive a warning message from the system.

A call on a voice radio from the ShotLink producer to either of the volunteers can usually clear up any discrepancy quickly. "Our goal is to have any data corrections made inside of one minute," Evans says, "and we consistently meet that metric."

Four times a year, the Tour hires professional surveyors to assess the quality and accuracy of ShotLink's measuring abilities. When the team compares ShotLink's accuracy of locating a ball in the fairway with the professional surveyor's data, ShotLink averages about 27 inches of deviation, Evans reports (meaning ShotLink is within 27 inches of being exactly right on the fairway). At the green, the average deviation is two inches. "Keep in mind that a golf ball is an inch and a quarter wide," Evans says.

"We spend a lot of staff time at the site focused on critiquing the accuracy," Evans says, "identifying any process or operational issues and making sure we're constantly evolving and improving."

Evans notes that Tour players use the ShotLink data at "varying levels." For example, some players break down the numbers with their instructors to find areas for improvement. Evans's team will create custom queries of the ShotLink data for the players who request it. "We provide all the data to players," Evans says, "and we provide them full access to the inquiry system."

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Last year, Tour veteran Fred Funk told *USA Today*, "The neatest thing about it is looking at how guys play, how close they're hitting their wedges, how close they're hitting their 3-irons, how far they're driving it and how certain holes are playing."

But without the volunteers' efforts, Evans isn't so sure there'd be a ShotLink. "I doubt that we would be able to build that business case," he said, if the Tour had to pay people to do the measuring.

The popularity of and reliance on ShotLink data has made retaining the 10,000 volunteers who use the ShotLink devices each year a high priority for Evans and his lean IT staff, who don't have time to train a new set of volunteers each year. "When we built the system we recognized we had limited time to train, and it was important that we had high retention," Evans says. "And we also needed to really build a culture around the mystique and value of these positions."

Today, Evans reports that the Tour is able to retain more than 80 percent of its volunteers on a year-to-year basis.

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The PGA Tour couldn't exist without those companies that sponsor individual tournaments or become partners to the Tour. ESPN.com pegged the cost of sponsoring a regular PGA Tour event at $7 million a year. (The Tour does not reveal what it charges sponsors.)

Evans's IT shop is also a part of this sponsorship model. The Tour recently replaced IBM with CDW as its "technology partner." Evans says that CDW provides both sponsorship money as well as technology help for his staff. "We're stretched thin, and we need good decision making to help us to reduce the research cycles" on topics such as software licensing and enhancing new ShotLink functionalities, Evans says.

IT's centralized group at the Tour's headquarters is made up of nearly 50 IT staffers. In addition, the 15-member mobile operations group travels to the Tour's tournament each week and provides network administration, scoring operations and troubleshooting help onsite. Evans reports that IT expenses compared with total revenue is slightly under 1 percent.

While one might expect Evans to be out "pressing the flesh" with sponsors and vendors on one of the Tour's 17 Tournament Players Club courses that it owns, he says, "We actually don't do a lot of that here." Evans is a golfer himself, a very respectable 10-handicapper, but, "I'm surrounded by a group of people who are significantly better at the game than I am." Nevertheless, Evans says, "I actually enjoy golf much more now than when I first came to work here." That was 21 years ago, when Evans signed on as a programmer/analyst working on the Tour's statistical, competition and player prize systems.

Evans is able to attend Tour events four to six times a year, depending on the IT projects on tap. "You can sit in conference rooms and talk about how things should work," he says, "but the reality check is actually going onsite and watching the reality of how the operation works."

Senior Editor Thomas Wailgum can be reached at *twailgum@cio.com*. To comment, go to *www.cio.com/article/329165*.

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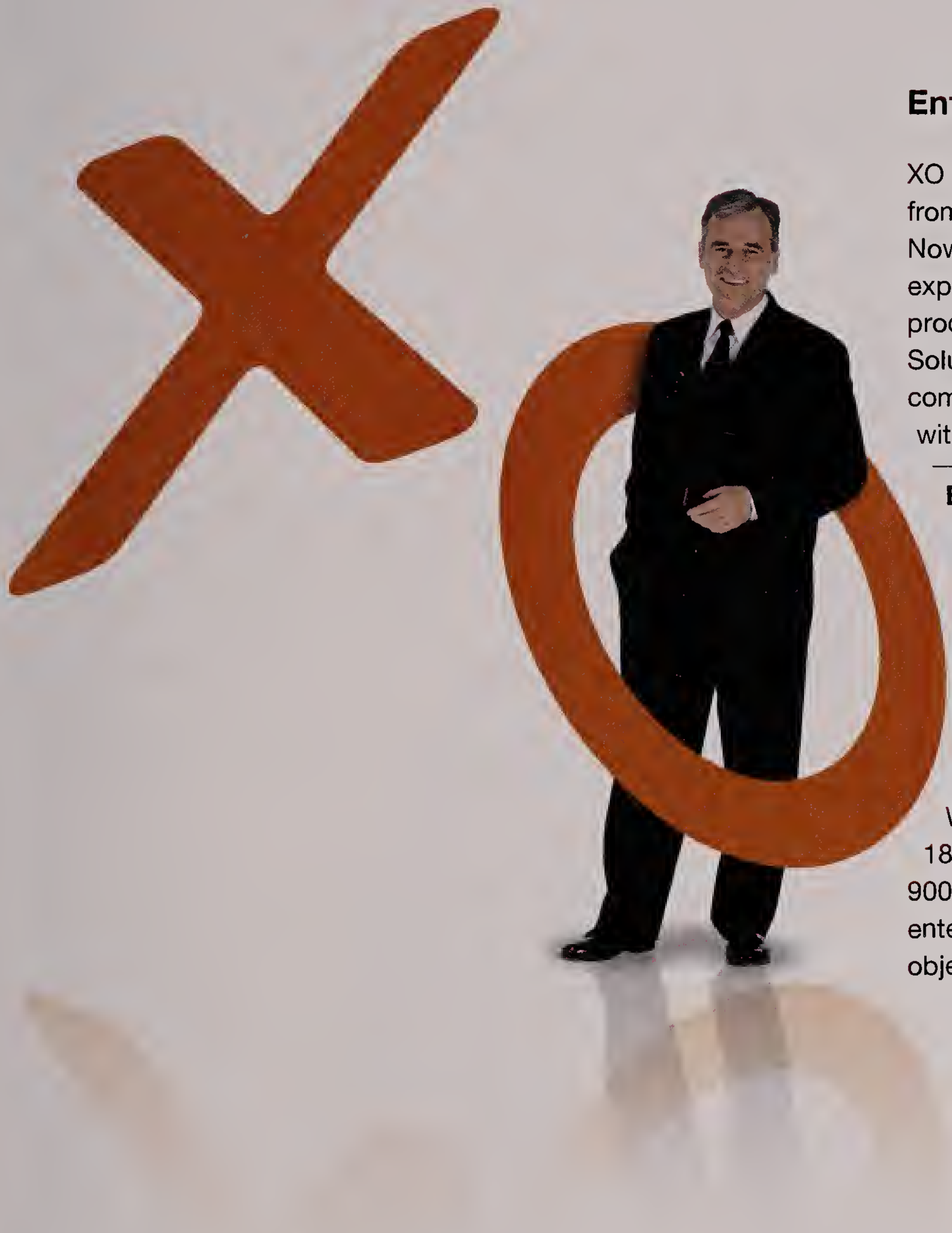

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FULFILLING THE ROLE'S NEW MANDATE

By Michelle McKenna

Think Like Your Customer

Universal Orlando's CIO challenges market assumptions to drive business in a shrinking economy

Perhaps I'm a tech-based version of a split personality. I'm the CIO of Universal Orlando Resort, but I'm also a mother of two and the planner of our family's vacations. In fact, I think of myself first as a theme park customer, second as a senior leader at Universal and finally as the company's CIO.

Recently, we were brainstorming new events that would bring more Florida residents to our theme parks during off-peak tourist periods. Our in-house marketing group was pitching proposals, and I offered the idea of a Guitar Hero competition. Everyone loved it. But that idea didn't come from being a CIO—it came from being a mother of two kids obsessed with the Guitar Hero video game (in which players perform as rock stars).

Thinking like our customers and focusing on our company's markets are among the most important ways we can fulfill our responsibility to contribute to informed decision making. In today's contracting economy, it's more critical than ever for CIOs to study market trends and find ways to maximize business opportunities.

Universal Orlando is one of many brands in the travel and entertainment industries competing for discretionary dollars spent by consumers on leisure time and vacations. Our universe is broad—whether we're focusing on our home state of Florida, elsewhere within the United States or internationally. Because our product falls into that discretionary expenditure category, we're often vulnerable to shifts in consumer confidence and virtually any other trend that influences the economy.

Of course, the competition boils down to a market of one—the individual consumer. People often assume that because of our high volume of guests, the experience we provide for them also has to be geared for the masses. But digital technology now enables guests to customize their experience, whether it's a Web-based interaction or an in-park attraction. For example, our new Hollywood Rip, Ride, Rockit roller coaster, launching in 2009, will allow guests to customize their ride experience by choosing the music that plays around them while on the roller coaster. When the ride ends, guests will be able to edit video footage of that experience into a music video to keep, share with friends or post online.

As CIO, I drive the knowledge, abilities and technologies to enable our customer-based market focus.

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The CIO's Role as Marketer

Our systems have always had valuable market-defining customer data, but we haven't always known how best to leverage it. Fortunately, I've been able to work closely with executive peers to implement business intelligence that triggers a more analytical, customer-centric approach to marketing and sales.

We get weekly data about what spending trends are per guest. CIOs should get copied on any reports like that, study them and look for patterns. Give your self permission to be a smart (and inquisitive) businessperson.

Knowledge of our market helps me drill down into our data to understand what is really happening in our business. For example, trends indicated that our annual pass holders—Florida residents, primarily—spend less on food, merchandise and other items than our day-pass guests. I wondered why that was and thought that perhaps we were losing details by averaging out the spending data. It turned out that some pass holders do spend on par with day guests, particularly when they attend our special events, Mardi Gras and Halloween Horror Nights. This analysis showed that we need to segment those annual pass holders more deeply in order to better understand them and market to them. So we are building a new data warehouse and business intelligence tools that will calculate spending by hour and by pass type. The initiative started in IT, and we can find many similar opportunities if we look at market details and ask questions.

Market Shifts in a Down Economy

In an economy where the overall market for vacation spending is shrinking, boosting the conversion rate of consumers considering a Universal vacation has become a business priority, which also means it's my priority. Our conversion rate—the number of people considering an online ticket purchase who execute the transaction—had plenty of room for improvement. We found that a lot of the conversion failure stemmed from clunky purchasing systems stuck together as e-commerce tools. By integrating these systems and their data, and by improving business process flow, I'm able to improve conversions and put IT in the revenue-producing seat—a seat I like to be in.

Another economic factor shaping our market is the weakness of the dollar, which is causing an obvious shift by international visitors away from the United States. To increase conversion and improve the international customer experience, we put ourselves in the customer's position and asked, What is the business process for someone traveling from abroad to buy a vacation here at Universal? Traveling to the United States has become a bigger hassle, so focusing on systems and processes executed at local airports can help reduce guest inconvenience upon arrival. We now have multiple initiatives planned to streamline the international guest's experience from initial ticket purchase on the Web to entry into our theme parks.

The Customer's Perspective

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How to Be a Market Maven

Any CIO can take a few steps to get market savvy. We get weekly data about what happened in the park and what the spending trends are per guest. CIOs should get copied on any reports like that, study them and look for patterns. Don't be afraid to ask questions about it; give yourself permission to be a smart (and inquisitive) businessperson. When I first joined the company and asked about market issues, people looked at me and thought, Why did she ask that? It doesn't have anything to do with technology. Over time they realized that I need to understand our data in order to do my job.

It's easy for me to access our customers because our theme park is next to my office. I put time on my calendar every week to go into the park. You can't do that in every business, but you can do something similar. Tell your CEO that to serve your customers, you need to understand what drives their decision making, and ask if there is a major customer willing to spend time with you.

I know it's hard to make time for that kind of thing. I don't always stick to it, but I try to reserve every Wednesday as a no-meeting day—that is, no meetings with my IT staff that day. They understand that it's my time to walk around and talk to my peer group, to do some research, to read my RSS feeds from travel industry websites or read information that helps me be a better CIO. If you find that 100 percent of your typical day is taken up with internal meetings and operational issues, then something must change. If you really want to be a senior business leader who's keenly focused on your target market, you have to make the time. CIO

Michelle McKenna is senior vice president and CIO at Universal Orlando Resort in Orlando, Fla., and is a member of the CIO Executive Council. She has been CIO of Centex Destination Properties and spent 13 years at Walt Disney World in IT, operations, marketing and finance.

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BUSINESS TECHNOLOGY LEADERSHIP

WEB 2.0—THREAT OR MENACE?
It's easy to mess up, hard to do right
Page 28

SOA
Where the benefits lie; where they don't
Page 53

The ALWAYS ON CIO

Working harder and longer than ever before, you need a way to preserve your productivity at work and your sanity at home. Here's how. Page 33

BY MATT VILLANO

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INDEX OF COMPANIES AND ADVERTISERS

Page numbers refer to the first page of the article(s) in which the company has a substantial mention.
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COMPANY INDEX

American Electronics Association . . 15
AmerisourceBergen Corp. 15
Capital One 15
CTPartners 15
Dannon Co. Inc., The 30
Dow Chemical 15
Flowers Foods 15
Flowserve Corp. 43
Foote Partners LLC 15
Forrester Research Inc. 15, 21, 30
Freddie Mac 15
Gartner Inc. 15
Genentech Inc. 30
IDC 43
Microsoft Corp. 12
NetCustomer Inc. 21
Oracle 15, 21
PGA TOUR Inc. 48
Rimini Street Inc. 21
SAP AG 15, 21
U.S. Department of Transportation 43
Universal Studios 54
Vail Resorts Management Co. 30
Virgin America 30
VistaPrint 15
Wainhouse Research 43

ADVERTISER INDEX

3PAR 4
Accenture C2
American Power Conversion . . . 2, 40
CommVault 6
CompuCom Systems Inc. 27
CXO Media Inc. 25, 49, 57, 59
Dell Inc. C3
Information Builders 42
Insight Direct USA, Inc. 29
Intel Corp. 19
InterSystems Corp. 9
Logicalis Inc. 13
Microsoft and Novell 11
Microsoft Corp. 34
Motorola Good Technology Group . 23
Primavera Systems Inc. 55
Qwest Communications 45
Rackspace 20
SAS 14
SunGard Availability Services Inc. 24a
Tata Consultancy Services 17
Toshiba America Business Solutions Inc. C4
Training Associates, The 47
TW Telecom 37
XO Communications 53
ZT Systems 51

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WHAT PLANNING?

Nearly **45%** of companies implementing Web 2.0 do **ad hoc** projects.

26% take a **strategic** approach.

AIIM

Losing CONTROL Online

14% of U.S. companies **DISCIPLINED** an employee for violating media posting policies.

5% **TERMINATED** an employee for these violations.

Proofpoint

OPEN TO OPEN SOURCE

53%

IT business executives and managers use open-source applications.

10%

more plan to do so next year.

CIO Research

A BOY'S WORLD

CONSIDERING A CAREER IN I.T.

[28%] Adolescent girls

[52%] Adolescent boys

Research in Motion

IT'S ONLY MONEY

25%

of Web projects have **failed to meet** their budgets.

Ruby on Rails

DELL #1
IN iSCSI STORAGE

Changing the economics
of storage

SIMPLIFY IT AT DELL.COM/NumberOneStorage

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Leading Innovation »»

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